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HOUSEHOLD HAZARDOUS WASTE MANAGEMENT IN MONTANA



Fall 1993

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PREFACE

Hazardous wastes are not confined to industrial or commercial settings. Households and public facilities, such as schools, also generate hazardous wastes. Solvents, oils, pesticides, paints, corrosives, and other materials commonly used in the home or school may be identical in hazardous composition to highly regulated industrial hazardous wastes. These wastes are often improperly handled and discarded due to the lack of knowledge or of a more acceptable and readily available alternative for their proper management. This in turn creates a situation where sanitation workers could become injured, ground water could be contaminated, explosions may occur during landfilling, and sanitary sewer and wastewater treatment plant operations are endangered. To avoid homeowner exposure to chemicals, the Montana Department of Health and Environmental Sciences (MDHES) recommends better management practices for the proper disposal of household hazardous waste (HHW).

These guidelines have been developed by MDHES to educate community officials on this issue, to provide suggestions on how to organize and operate a HHW collection program, and to inform them of the requirements for registration and operation of these programs. Our efforts are intended to expand awareness of the need for proper disposal practices in Montana. In 1991, the Montana Legislature passed House Bill Number 858 which provides funds for statewide HHW public education programs (codified in the Montana Solid Waste Management Act, Section 75-10-215, Montana Code Annotated (MCA)).

Those wishing additional copies of this publication or general information on HHW programs are invited to contact MDHES or the Montana State University (MSU) Extension Service at the following addresses:

Montana Department of Health and Environmental Sciences
Solid and Hazardous Waste Bureau
P.O. Box 200901
Cogswell Building
Helena, Montana 59620-0901
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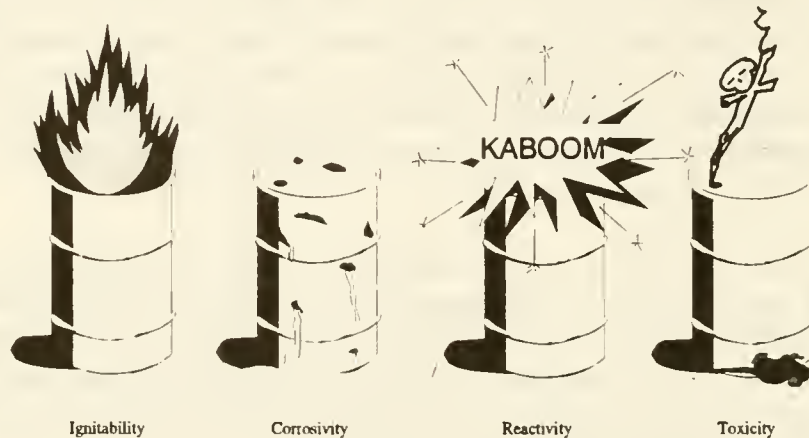
Montana State University Extension Service
Solid Waste Education Program
Taylor Hall, Room 109
Bozeman, Montana 59717
(406) 994-3451

Public information in the form of handouts, videos, slide presentations, and education packets are also available upon request.

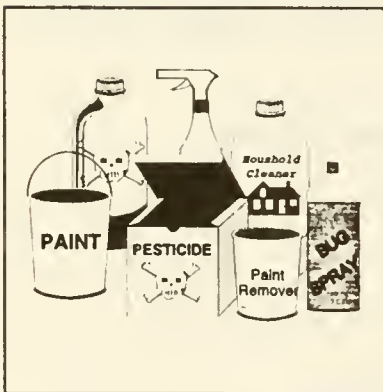
INTRODUCTION

Definition of Household Hazardous Waste (HHW)

The Montana Solid Waste Management Act, Section 75-10-203(4), MCA, defines household hazardous waste as products commonly used in the home that, due to corrosivity, ignitability, reactivity, toxicity, or other chemical or physical properties, are dangerous to human health or the environment.



Household hazardous waste includes, but is not limited to, the following:



- ▶ Drain Openers
- ▶ Oven Cleaners
- ▶ Wood and Metal Cleaners and Polishes
- ▶ Paint
- ▶ Paint Thinners
- ▶ Paint Strippers and Removers
- ▶ Automotive Oil and Fuel Additives
- ▶ Grease and Rust Solvents
- ▶ Starter Fluids
- ▶ Adhesives
- ▶ Herbicides, Pesticides, and Fungicides/Wood Preservatives

Refer to Appendix A for examples of household hazardous wastes, their hazardous components and potential hazards, and alternative products.

Hazards Of Improper Use, Storage, And Disposal

Almost every American household produces small amounts of hazardous waste. Many of these householders are unaware of the hazards of common household products and do not see the potential harm of throwing away old cans of paint or pesticides. Media attention generally focuses on the problems of industrial hazardous wastes, ignoring household wastes even though they are used and disposed of in quantities that are cumulatively large enough to cause concern.

Homeowners generating HHW are specifically exempt from state and federal hazardous waste regulations promulgated under the United States Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA), Subtitle C statutes. This also applies to the transportation, treatment, storage, and disposal of household hazardous wastes. Instead HHW handling and disposal in Montana is governed by state and federal solid waste regulations promulgated under RCRA Subtitle D statutes.

The risks associated with household hazardous products may be greatly reduced through intelligent use, storage, and disposal practices. The following describes recommended management practices that minimize hazards.

- a. Using Household Hazardous Products. Consumers should look at product labels for the words CAUTION, WARNING, DANGER, or DO NOT GET ON THE SKIN. These words should alert consumers that the product they have in their hands may be hazardous if not handled properly. Proper use, storage, and disposal may minimize the "hazardous" characteristics or nature of household hazardous products. To help inform consumers as to the proper use, disposal, or reuse of a product, most manufacturers place telephone numbers on their product label.

- | | |
|-----------------|--|
| Hint #1: | Carefully read and follow <u>all</u> warning labels. |
| Hint #2: | Use protective clothing to limit exposure if appropriate, such as old clothing, rubber gloves, or goggles. |
| Hint #3: | Prevent spills and leaks, cleaning them up immediately if they occur. |
| Hint #4: | Fully understand the potential hazards of the product before using it. |
| Hint #5: | Purchase only the amount you need. |

Hint #6: If you have any leftover cleaning products, paint, automobile products, or personal care products, give them away to someone who could use them up.

Hint #7: If you have any pesticides, such as herbicides and insecticides, contact the Montana Department of Agriculture for more information. They may be regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

b. Storing Household Hazardous Products. Consumers should carefully store household hazardous products to prevent pollution or health risks. If stored in unmarked containers, these substances may be mistaken for another product and misused. Hazardous products should be stored in their original container with the original label intact. Containers may deteriorate over time. If left unchecked, hazardous substances could leak and pollute soils or water, release fumes, or cause uncontrolled exposure.

Hint #1: Store household hazardous products away from living areas, away from food and water.

Hint #2: Store household hazardous products so that they are inaccessible to children and animals.

Hint #3: Store household hazardous products in a well ventilated location.

Hint #4: Do not store non-compatible material together.

c. Disposal of Household Hazardous Products. Most household hazardous products are disposed of in ways which could pollute the environment. There are several possible reasons for this: (1) The public is unaware of the dangers created by "normal" disposal methods; (2) There may be few environmentally safe disposal options available to consumers; and (3) If other disposal options do exist, consumers are not aware of them. Currently in Montana, there are limited disposal options available for HHW, either in a licensed municipal (Class II) landfill or incinerator.

- ▶ HHW which is discarded with household trash can injure refuse workers and may pollute the environment around landfills. HHW buried in landfills may cause a fire, explode, release toxic fumes, or contaminate water supplies. Hazardous material spread out on the ground may contaminate soil, leach through the soil and contaminate ground water, or be carried into water bodies via surface run-off.

- ▶ New state regulations, driven by federal guidelines, have been designed to make existing and new municipal (Class II) landfills more environmentally safe through stricter siting, design, operating, and closure requirements. With these new regulations, state and federal agencies are trying to reduce the chances of a solid waste disposal facility harming the environment. Consequently, it may be harder to dispose of HHW at such a facility in the future. **Consumers should contact local licensed solid waste disposal facilities prior to discarding HHW in a garbage container.**
- ▶ Burning hazardous wastes may cause explosions, release toxic fumes into the atmosphere, or concentrate toxic chemicals in the ash.

Pouring HHW down a sanitary sewer system, if connected to a wastewater treatment plant, is also an option, depending upon what waste you are discarding.

- ▶ HHW which is poured down household drains may corrode plumbing, collect in the trap and release fumes, cause sewage system malfunctions, and contaminate ground water supplies. Flushing the waste with a lot of water and triple rinsing the empty container before placing it in the trash can reduce its impact to the environment. HHW should not be poured down seepage systems, it could cause system malfunctions as well as potentially contaminate ground water supplies. **Consumers should contact local publicly owned sewage treatment facilities prior to pouring HHW down a sanitary sewer drain.**
- ▶ **HHW should never be disposed of down storm sewers.** Wastes which are poured down storm sewers are usually discharged directly into rivers and streams. Once there, many toxic wastes decompose very slowly and may accumulate in the food chain.

The most environmentally safe option for HHW disposal is to transport it to a licensed hazardous waste treatment, storage, and disposal facility. There, HHW is treated as a RCRA Subtitle C regulated hazardous waste, as if a large business had generated it. At this time, there are no commercial RCRA Subtitle C hazardous waste treatment, storage, and disposal facilities in Montana. Instead, most RCRA Subtitle C regulated hazardous waste and HHW have to be transported out of state. The cost of shipping this waste to an environmentally safe disposal facility may be very expensive, making it an economically taxing option.

The following chart, based on the MSU Extension Service's *Household Hazardous Waste - Disposal Recommendations* fact sheet (see Appendix B), illustrates some disposal options available for typical hazardous wastes used around the home or garden. Not all options may be available in your community. Therefore, before disposing of HHW in either a sanitary (city) sewer or in a municipal landfill, please contact the facility's owner or operator for approval.

*Household Hazardous Waste Disposal Recommendations For Typical Wastes
Generated Around The Home And Garden*

KITCHEN	Solvent-containing Cleaners	Cleaners containing solvents should not be poured down the drain or down a toilet. Nor should they be discarded in the trash in a liquid state. To stabilize the cleaners, pour a proximately one cup at a time into a cardboard box or can lined with a plastic bag. Mix it with an absorbent material, such as kitty litter, saw dust, or sand. LET IT DRY in a well ventilated area where animals and kids cannot come in contact with it. When the cleaner has evaporated, you can throw the absorbent material into the trash.
	Non-corrosive Cleaners	Non-corrosive cleaners that do not contain solvents can be flushed into a sanitary sewer system, if they are liquid, with plenty of water. If the cleaners are solid, then they can be disposed of in a municipal landfill.
	Corrosive Cleaners	Very small quantities of corrosive cleaners in liquid form and crystals can be flushed down the toilet with plenty of water IF CONNECTED TO A SANITARY SEWER SYSTEM.
BATHROOM	Toilet Bowl Cleaners	Very small quantities of corrosive toilet bowl cleaners in liquid form and crystals can be flushed down the toilet with plenty of water IF CONNECTED TO A SANITARY SEWER SYSTEM.
	Nail Polish	Solidified nail polish can be placed in the trash. If polish is still a liquid: <ul style="list-style-type: none"> ► Place in a well ventilated area where kids and animals cannot get into it, and remove the cap. Let sit for several days. When hard place in the trash. ► Pour polish into a cardboard box or can lined with a plastic bag. Mix it with an absorbent material, such as kitty litter, saw dust, or sand. LET IT DRY in a well ventilated area where animals and kids cannot come in contact with it. When it has evaporated and/or solidified, you can throw the absorbent material into the trash. ► Coat scrap wood or cardboard with the nail polish, let it dry, and then dispose of the painted material in the trash. Let the polish coating the inside of the container harden, and then place in the trash.
	Alcohol Based Lotions (aftershave, perfumes, etc.)	Alcohol based lotions can be poured down a sanitary (city) sewer system with plenty of water.
GARAGE	Antifreeze	Antifreeze can be poured down a sanitary (city) sewer system with plenty of water.
	Paint/Thinner	Paints and thinners should not be poured down the drain or down a toilet. Nor should they be discarded in the trash in a liquid state. If the paint and thinner has solidified in the can, they can be disposed of in a municipal landfill. If however, they are still in liquid form: <ul style="list-style-type: none"> ► Pour a small amount into a cardboard box or can lined with a plastic bag. Mix it with an absorbent material, such as kitty litter, saw dust, or sand. LET IT DRY in a well ventilated area where animals and kids cannot come in contact with it. When the paint or thinner has evaporated and/or solidified, you can throw the absorbent material into the trash. ► Coat scrap wood or cardboard with the leftover paint, let it dry, and then dispose of the painted material in the trash. Let the paint coating the inside of the can harden, and then place the can in the trash.
GARDEN	Pesticides	Rinse empty pesticide containers three times before throwing them in the trash and use the rinse water as a pesticide. Do not dispose of herbicides and insecticides down the drain or in the trash. Hold on to them until a HHW or pesticide collection event occurs in your area.

Alternatives To Disposal

As discussed previously, there are few options available to householders for the safe disposal of hazardous wastes. Therefore, MDHES recommends the following be done first before householders consider discarding HHW:

- a. Substitute a Less Hazardous Product. There are many less hazardous household products available which may be used to accomplish the same job. Appendix A contains some recipes for less hazardous and non-hazardous products. Other recipes may be found in MSU Extension Fact sheets available at your local county Extension Office (see Appendix B). Concurrently, check your local grocery store for products that may be less hazardous.
- b. Buy Only As Much As You Need. If a hazardous product must be used, the least hazardous product available should be chosen by comparing ingredients listed on the product label. Only enough material to accomplish the job should be purchased. Any excess material should be stored for future use, stored until a safe disposal method is available, and/or passed on to a friend who may use it.
- c. Use It Up Or Give It Away. Products which are still useful and are not banned may be used up according to the manufacturers' instructions. If consumers cannot use it up, they may be able to find someone who can. For example, local theater groups or school drama clubs may want paint for set construction. Shelters or churches may use cleaning products. Communities may utilize leftover paint for covering graffiti, etc. Householders should call around their community to find out if such options exist.
- d. Household Hazardous Waste Collection Programs. HHW collection programs are designed to provide homeowners and others with a proper and safe outlet for the disposal of HHW. There have been at least five HHW collection programs in Montana since the early 1980s:
 - ▶ 1984 - MDHES, EPA, and Missoula County organized the state's first general HHW collection event in Missoula.
 - ▶ 1992 - The City of Bozeman held its first latex paint "drop and swap" program.
 - ▶ 1993 - The City of Bozeman held its second latex paint "drop and swap" program, and the City of Helena held its first paint swap. Bozeman also held its first general HHW collection event (discussed in more detail later in this document). Missoula, Great Falls, Billings, and Kalispell have HHW collection events planned in either 1993 or 1994.

In Montana, the following organizations provide advice to residents concerning household hazardous products and wastes:

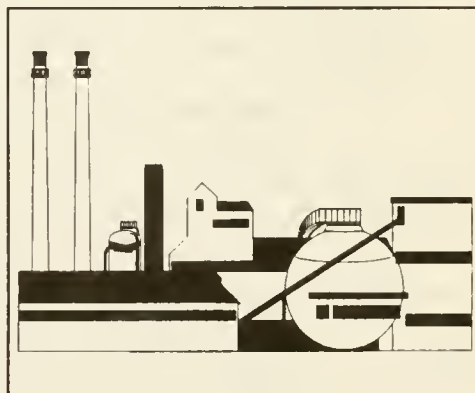
1. The **Montana Department of Health and Environmental Sciences** provides information on hazardous material, helps fund public workshops and educational programs, and has a library of HHW videos, slides, and fact sheets.
2. The **Montana Chamber of Commerce** publishes *The Industrial Waste Exchange*, advertising waste that could be reused, rerefined, or recycled.
3. The **MSU Extension Service, Solid Waste Education Program** produces numerous fact sheets discussing hazardous material, used oil, and other pertinent topics. Additionally, the Extension Service has an extensive HHW library and offers educational programs and workshops on HHW.

In most counties in Montana, local Extension Service offices, county health departments, and other agencies may also assist residents on various issues concerning hazardous material.

Conditionally Exempt Small Quantity Generators

People or businesses who generate no more than 100 kilograms (kg) (about 220 pounds (lb) or 25 gallons (gal)) of hazardous waste and no more than one kg (about two lb) of acutely hazardous waste in any calendar month, are conditionally exempt small quantity generators (CESQG's). Several examples of CESQG's include: dry-cleaning and laundry operations; printing and publishing facilities; photo finishing facilities; pesticide applicators; and automotive and heavy equipment maintenance facilities. These generators are required to handle their wastes in the following manner:

- ▶ Identify all hazardous waste generated.
- ▶ Send this waste to an EPA approved RCRA Subtitle C hazardous waste treatment, storage, and disposal facility, a municipal (Class II) landfill, or a facility that will beneficially use, reuse, recycle, or reclaim the waste.
- ▶ If connected to a sewage treatment plant, flush the liquid down the drain with plenty of water (CESQG's should contact treatment plant prior to utilizing this least recommended disposal option).



- ▶ Never accumulate more than 1000 kg (2200 lb) of hazardous waste on their property.

Federal legislation states that state-approved HHW collection programs that manage both CESQG waste and HHW are not subject to the full RCRA Subtitle C requirements. In Montana, HHW disposal is governed by solid waste regulations under RCRA Subtitle D statutes. Conditionally exempt small quantity generated waste disposal falls under both RCRA Subtitle C and RCRA Subtitle D statutes.

CESQG's are interested in participating in HHW collection programs because they want to best manage their waste to reduce potential future liability for cleanup of facilities where wastes have been mismanaged. Their quantities are too small to economically manage using hazardous waste disposal firms and these generators usually lack the expertise and resources to manage their wastes under state and federal hazardous waste regulations under RCRA Subtitle C. Consequently, they discard their hazardous waste in a licensed municipal solid waste landfill.

Because CESQG's can accumulate up to 1000 kg (2200 lb) of hazardous material, these generators may flood a collection event with their wastes. Therefore, if a collection program is on a limited budget, it is important to define what kinds of wastes will be acceptable and whether or not CESQG's will be allowed to participate.

Throughout this document, discussions on household hazardous wastes may also be applicable to CESQ generated wastes.

ORGANIZING A COLLECTION PROGRAM

HHW collection programs generally have six goals:

- (1) Provide environmentally safe disposal for HHW.
- (2) Educate residents on the best methods of HHW use and disposal.
- (3) Educate residents on less hazardous alternatives available in stores or that may be created in the home.
- (4) Increase general public awareness of the hazardous materials found in most homes and how these materials may affect human health and the environment.
- (5) Remove household hazardous products from homes to reduce exposure, potential injuries, and pollution resulting from their improper use.

(6) Reduce dangers to refuse collectors and other sanitation workers.

Nationwide, the most recognized approach to HHW collection is the drop-off program. This type of collection program generally involves selecting one or more drop-off sites in a municipality, county, or multi-county area. The participating entities must transport the material to the site(s) and unload the waste as directed. A licensed hazardous waste management company may be used to transport wastes to the appropriate facility and dispose of the collected materials, as well as to identify unknown wastes. This is similar to the operation of a recycling center for municipal wastes except that the handling of hazardous materials requires much more care for health and safety reasons.

The cost of holding a collection event may range between \$50.00 to \$200.00 per participant. These figures usually include the cost of hiring a consultant, publicity for the event, and equipment, transportation, and final disposal costs.

A HHW collection program takes a great deal of organization, advance planning, and public education to succeed. On average, it may take up to six months of planning before the scheduled collection date. However, if a community is planning a large collection event or several events and has limited financial and human resources, it may take longer to organize.

There are numerous steps involved in organizing a HHW collection program. Some of these steps are discussed below.

Step 1: Organize a HHW education campaign that will focus on alternatives, reuses, alternative disposal options, and proper disposal options. A good education program designed to reach all age levels can help prevent unwanted waste at a HHW collection event. And, in the long run, a good education program can make a collection event obsolete. One such program is available through Montana's County Extension Service Offices and MDHES. It is called *The Hazard Free Home* education program. This program has been designed to help consumers identify HHW in their homes, as well as identify alternatives for the selection, storage, and disposal of potentially hazardous products used in the home.

Step 2: Contact and involve all potentially interested groups at the earliest stages of organizing. The program coordinator(s) need the support and assistance of as many community officials and organizations as possible to develop a successful project. Contact such groups as: public works departments; local, county and state health departments; fire and/or police departments; school systems; county Extension Service offices; fraternal organizations; environmental groups; and interested citizens. It is important to have the cooperation of as many of these groups as possible in order to carry out the various steps involved in having a HHW collection program.

Step 3: Invite appropriate community groups to an initial meeting to discuss the project. Provide them with background information on household hazardous products.

This document provides some basic information, however there are other documents and videos available. See Appendix B for additional resources.

Discuss and identify the steps that must be taken to organize a collection day in your community. Address the following questions in your discussions:

- ▶ How many days will the HHW collection event run?
- ▶ When will the event(s) take place?
- ▶ Where will the event(s) be located?
- ▶ What public education methods will be used?
- ▶ What will your budget be?
- ▶ Where will your funds come from?
- ▶ Have you notified state and local governmental agencies?
- ▶ If applicable, which consulting firm will be hired? What will its duties be?
- ▶ Who will transport the waste collected to the appropriate disposal or recycling facility? Will the consultant act as the transporter?
- ▶ What wastes will be accepted at the event?
- ▶ Of the waste accepted, how much will be recyclable? What special containers will be needed for the recyclables?
- ▶ Will CESQG's be allowed to participate?
- ▶ What about liability for any injuries or damages that occur during the collection event?

And finally, work out goals for the program and establish a schedule for getting them done.

Step 4: Contact the Department of Health and Environmental Sciences, Solid and Hazardous Waste Bureau, Solid Waste Program in order to register the event. The registration application is included in this document (see Appendix C). There is no fee associated with this application.

Step 5: Involve local newspapers, television, and radio stations from the beginning. Develop press releases and send letters to the editor to inform the public about HHW and the collection program. The media is also a very good tool in the education portion of the collection program.

Step 6: Hold meetings to discuss program details and ensure that the program is moving ahead on schedule. Try to divide work tasks among subcommittees or subgroups. Get all members involved.

Step 7: Select a convenient date and location for the HHW collection event that enables and encourages people to participate. Programs in other states have been found to be very successful if held on a Saturday or Sunday. The time of the year is also important to a HHW collection event. If the event is to be held inside a building, then any time of year is possible. If, however, an outside event is planned, then it should be held during warmer months. Springtime is a good time to have an event because most people do a thorough cleaning of their closets and cupboards during their "Spring Cleaning" efforts.

Choose a location that is easily accessible, centrally located, and well known to the general public. A location that provides a safe environment for the transfer of hazardous chemicals is preferable, such as a parking lot at a fire station or school, or a shopping mall. The location should provide sufficient space to set up the drop-off/collection center and allow for parking spaces for workers. The surface of the site should be impermeable, such as concrete or asphalt paved. Take into account any environmental drawbacks to a site, such as storm drains or nearby rivers or lakes which may be affected if a spill should occur. For liability reasons, it may be advisable to hold the event on municipally-owned property. If the event is held on private property, the owner may have to get involved in contract and insurance issues with the licensed hazardous waste consulting firm. Also, the collection site should be set up in order to trap all spills that might occur, either by constructing a dike or by placing a tarp down under the workers.

The proposed site should also provide shelter from rain for the waste drums and for the workers handling the wastes. A tarp or tent may be used. Concurrently, arrangements should be made for sanitary facilities, hand washing, rest/eating areas, and emergency equipment (showers, fire extinguisher, etc.). The local hospital should be notified prior to an event in case of a serious injury. Having an ambulance on-site might also be advantageous.

Non-hazardous waste may be generated at a HHW collection event, such as paper, empty paint cans, and food wastes. Arrangements should be made to have receptacles on-site for such wastes.

Step 8: Require waste to be delivered in their original containers. This may help the workers determine the exact chemical make-up of the substance. Again for liability reasons, it may be appropriate for the workers to remove the waste from the homeowner's vehicles. This may prevent spills, confusion, and accidental injury to both the workers and the participant.

MDHES recommends keeping an inventory of the waste brought in to the event, along with the name and address of the owner of that waste. In case some unidentifiable waste is brought in, the owner could be contacted.

After the waste has been removed from the vehicle, it should then be sorted into various categories, such as pesticides, cleaners, and paints. Once sorted, workers should pack waste in absorbent material to prevent breakage or leakage. Paints and used motor oil may be consolidated for recycling or reuse purposes.

COLLECTION PROGRAM RECOMMENDATIONS

There are several recommendations MDHES would like to make concerning HHW collection programs. They are discussed on the following page.

- I. The applicant should not accept the following wastes at the collection event:
 - ▶ Radioactive waste.
 - ▶ Biologically active wastes, such as infectious (red bag) and chemotherapeutic wastes (needles, bandages, body parts, and body fluids).
 - ▶ Explosives and ordnance materials (ammunition).
 - ▶ Dioxin-containing wastes.
2. The applicant should not accept waste from parties depositing more than 100 kg (approximately 220 lbs.) of hazardous waste at any one scheduled collection event.
3. HHW collected should be recycled or reused to the greatest extent possible (this would significantly help to minimize disposal costs).
4. Waste exchanges may be a part of a collection event. Persons with wastes could be directed to deposit their waste suitable for reuse to an area marked "waste exchange" or "swap". Individuals could take home material from this area for their own use.

5. The hazardous waste consultant or program coordinator should maintain a record of operation of the collection facility and submit a copy of the record to MDHES. The record, at minimum, should contain a summary of participant types, amount of waste from each type of participant, types of wastes accepted and their amounts, and the locations of ultimate disposition of the wastes. At the event, an inventory of the names and the types of materials each participant brought in should be kept.

PUBLIC EDUCATION

Public education is an important aspect of a HHW collection program. Public education programs should focus on the following:

1. Promoting substitute products that are less hazardous.
2. Promoting participation in HHW collection and recycling programs.
3. Identifying proper storage and disposal methods.
4. Encouraging better home, school, and business management practices, such as buying only the amount of a particular product needed to get the job done.
5. Increasing public awareness of the presence of hazardous materials in the home, school, and work place and the consequences of their improper use and disposal.



Collection program participation appears to be directly proportional to the amount of publicity and education material utilized. Some effective techniques include posters, handouts, and special lesson units in school. A community does not have to design their own education program from "scratch". There are "ready made" education packages available that can be personalized, depending upon a communities needs. One such education program package is *The Hazard Free Home* program, designed by the Montana State University Extension Service, in conjunction with MDHES. This education package was developed to be a community volunteer self-guided and self-contained HHW education program. The program features:

- ▶ "What-to-say and what-to-do" presentation script.
- ▶ Overhead transparency masters.
- ▶ A pre-test and post-test.

- ▶ Activities.
- ▶ HHW news releases and radio spots.
- ▶ Lesson discussion sheets.
- ▶ HHW consumer factsheets (see Appendix B).
- ▶ Two slide presentations:
Disposal of Household Hazardous Wastes - A presentation adapted from a slide presentation originally developed by Cornell University.
The Hazard Free Home - Product Alternatives - A presentation adapted from a slide presentation originally developed by Washington State University Extension Service.

Public service announcements on radio and television, and articles in local papers also help to spread the word about a collection event. Let the public know when and where the event will occur, what to bring, and how to bring it. A map illustrating the layout of the collection site and the direction of traffic flow is also helpful to the general public.

A HHW survey is another important part of HHW education. Upon entering the collection site, participants may be given the survey to fill out. This would help determine how successful the education program was, the public's awareness of household hazardous products, and who participated.

FINANCING A HHW COLLECTION PROGRAM

The budget for a HHW program should be carefully planned. Funds are needed for:

- ▶ Hiring a consultant (if applicable).
- ▶ Collecting, sorting, possibly storing, transporting, and disposing of the waste.
- ▶ Designing and implementing the education portion of the program.
- ▶ Designing and implementing the publicity campaign.
- ▶ Securing liability insurance (if applicable).
- ▶ Securing equipment (for example tarps, barrels, and/or handouts)

Possible sources of funds in Montana include:

- ▶ Business and industries.
- ▶ Local government.
- ▶ Civic groups.
- ▶ Fraternal Organizations.
- ▶ Grants from private foundations or public interest groups.
- ▶ A fee charged to participants for disposal of their HHW (many programs just charge CESQG's due to the large amount of waste they tend to bring in).
- ▶ "Adopt a Barrel" programs where industries or private groups are asked to pay for the disposal of a full barrel.

At this time, the State of Montana does not have the funds to monetarily support HHW collection programs. However, due to increased public and governmental awareness of the need to dispose of HHW in an environmentally safe manner, this situation may change in the future.

HIRING A LICENSED HAZARDOUS WASTE MANAGEMENT CONSULTANT/TRANSPORTER

A key element in planning a HHW collection event is determining whether or not to hire an experienced consultant. Although hiring a consultant is not required, consultants can take a lot of stress off the planning committee. Consultants can provide experience, personnel, materials and equipment to, at minimum, identify and categorize wastes, properly package waste, label and mark the containers. And, they can arrange for the transport of waste to a hazardous waste management facility in compliance with all applicable state and federal laws and regulations regarding hazardous waste management and the transportation of hazardous materials. On the other hand, hazardous waste consultants that work with HHW can be hard to find and expensive.

Tips For Hiring A Consultant

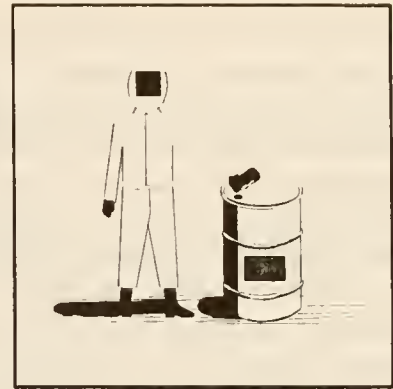
1. Ask for references from previous clients in your area - and check them!
2. Ask about their experience in the type of work you need.

3. Ask if they will be available for your event.

4. Remember, the cheapest bid is not always the best bid.

5. Ask how they will run the event or handle the storing, packing, transporting, and recycling/disposing of the HHW collected.

6. Ask if the firm will provide the equipment and trained personnel for the event.



7. Ask if they will have the ability to make on-site identification using field or full-scale laboratory analysis. The firm should describe what types of field identification will be provided at the HHW collection event.

8. Ask if they will have the appropriate liability insurance.

9. Ask if the firm has an EPA identification number necessary for tracking HHW disposal. MDHES does not require the program, consultant, or transporter to obtain an identification number. However, the Montana Department of Transportation or the Public Service Commission may require it of the transporter. Depending upon the hazardous waste disposal facility, an EPA identification number may nor may not be required for all agencies involved, such as the program or the consultant. Early in the planning stages of a HHW collection program, the hazardous waste disposal facility should be contacted in order to determine who will need EPA identification numbers.

10. Know how the firm will package the various wastes brought to the collection event. Two basic packaging types used are:

- ▶ **Lab Packing** - Containers of compatible wastes collected at HHW collection events are put directly into a larger container or drum and surrounded by an inert absorbent material before the drum is sealed and labelled for shipment.
- ▶ **Consolidation** - The containers of compatible wastes are opened and their contents poured directly into a larger container. When the drum is full, it is sealed and labelled for shipment.

Do not assume the consultant is taking care of all aspects of a HHW collection program. Follow up and make sure everything is being done. **Remember, you could be responsible for what your consultant does or does not do!**

The matrix found in Appendix D has been compiled by the MDHES Underground Storage Tank Program to assist you in hiring a firm. Information presented in the matrix is slanted towards underground storage tank work. It is voluntarily provided by the firms and compiled without verification, by MDHES. If a particular firm is not listed in the matrix, that indicates only that a firm has not sent MDHES information, and does not imply it is less qualified than those listed. For a more complete listing of hazardous waste consultant firms, disposal facilities, and transporters, please see Appendices E, F, and G respectively.

Users of consultant services should exercise care in selecting consultants because responsibility for any problems or accidents that might occur at a HHW collection event may remain with the organization running the event. You should take the same care in hiring an environmental consultant that you take in employing any contractor or employee you use.

WORKER SAFETY AND THE DEPARTMENT OF LABOR

Household hazardous waste (HHW) should be treated with respect, caution, and with common sense at all times. Proper handling and disposal of HHW may decrease the liability associated with the use of such material. This is also the case with HHW collection programs. The less the public comes in contact with the waste being collected, the lower the chances of there being an accident. Concurrently, the more your workers are trained in hazardous waste identification and handling, the lower the chances of spills, fires, and other accidents. It is important to understand that there are liabilities associated with a HHW collection program. Therefore, the program coordinators should know their responsibilities associated with these liabilities. The United States Department of Labor, Occupational Safety and Health Administration (OSHA) should be contacted in order to determine what safety procedures may be required for both the general public and the workers of the event. If you hire a consultant and/or a transporter for the collection event or there is a major spill of hazardous waste, OSHA may have jurisdiction.

In conclusion, hazardous waste disposal costs are relatively expensive and have been increasing. In the long run, it will probably be more economical to stress source reduction, alternative products, and reuse, rather than collection programs.

HHW COLLECTION PROGRAM CASE STUDY: BOZEMAN, MONTANA

On June 12, 1993, the City of Bozeman held its first general HHW collection event. This was the second such event in Montana since the early 1980s when MDHES, EPA, and Missoula County held the state's first HHW collection event in Missoula. The Bozeman

event was held inside the City Shop Complex, from 9:00 a.m. to 4:00 p.m. Bozeman had two major goals for the event:

1. To help educate the public about HHW and how they can dispose of them to create a "Hazardous Free Home".
2. To help prevent HHW from being disposed of in the city's licensed Class II (municipal) landfill, which could contaminate the surrounding soil, ground water, or nearby streams.

Special Resource Management (SRM) out of Butte, Montana, was hired to conduct the collection event as well as handle the packaging, storing, removal, and disposal of the collected material. This material was then transported to an EPA approved RCRA Subtitle C treatment, storage, and disposal facility.

The collection event was open to city residents only. Proof of residency was required via driver's license or water/sewer bill stub. No commercial businesses were allowed to deposit material at the event, thus reducing the number of CESQG's that could participate.

Residential waste that was accepted included:

- ▶ Mercury Batteries.
- ▶ Household Cleaning Products.
- ▶ Lead and Oil Based Paints.
- ▶ Pesticides.
- ▶ Fertilizers.

Certain residential wastes were not accepted at the HHW collection event, such as latex paint, antifreeze, asbestos, and used motor oil because the City of Bozeman offers alternative disposal methods (for example their annual latex paint swap). Other non-acceptable wastes included explosives, radioactive wastes, 2-4-5T (weed killer), gas cylinders, Pentachlorophenol (PCB), PCB-containing capacitors, and unknown waste.

Flyers and local newspaper, radio, and television coverage were all part of the education campaign associated with this HHW collection event in order to get residents to bring in the appropriate wastes. The City of Bozeman also conducted a survey on the day of the event, asking those who participated questions such as:

- ▶ How did you hear about the event?
- ▶ How often would you use this type of disposal service?

- How much would you be willing to pay to use this service?

The estimated cost to Bozeman for the one day collection event was \$20,000.00. However, the actual cost for the event was approximately \$16,000.00, including the cost of filling and disposing of 18 fifty-five gallon drums and paying SRM to run the event. This figure does not include advertising or the labor required by City of Bozeman personnel for traffic control, documentation of incoming wastes, dumpster removal of packaging wastes, and filming the actual event.

The event was a success! Although the 122 people who participated represents only a small proportion of the approximately 24,000 residents of Bozeman, the city is planning to hold another collection event in 1994. The HHW collection event did not attract unwanted wastes or unwanted customers, and Bozeman did not run out of money to cover the cost of packaging, transporting, and disposing of the waste collected. And, the following products were diverted from being landfilled, poured down a drain, or discarded illegally:

PRODUCT	QUANTITY Liters (Gallons) (unless specified otherwise)
Household Cleaners	94 (25)
Lead and Oil Based Paint	1041 (275)
Paint Thinner	130 (34)
Gasoline	56 (14)
Herbicides	20 (5)
Batteries (mercury)	50 kg (110 lb)
Fertilizer	20 kg (44 lb)

FOR MORE INFORMATION CONTACT THE FOLLOWING AGENCIES:

**Department of Health and
Environmental Sciences**

Occupational Health Bureau
Room A113
Cogswell Building
Helena, Montana 59620
(406) 444-3671

Solid and Hazardous Waste Bureau
P.O. Box 200901
Cogswell Building
Helena, Montana 59620-0901
(406) 444-1430

Water Quality Bureau
Room A206
Cogswell Building
Helena, Montana 59620
(406) 444-2406

**Montana State University Extension
Service-Solid Waste Education Program**

Taylor Hall, Room 109
Bozeman, Montana 59717
(406) 994-3451

**Montana Department of Agriculture
Agricultural & Biological Sciences
Division**

P.O. Box 200201
Helena, Montana 59620-0201
(406) 444-2944

United States Department of Agriculture

Federal Building
Helena, Montana 59626
1-800-359-3997

United States Department of Labor

Occupational Health and Safety Bureau
Billings Area Office
19 North 25th Street
Billings, Montana 59101
(406) 657-6649

**United States Environmental Protection
Agency**

Communications Services Branch
Office of Solid Waste
401 M. Street, Southwest
Washington, D.C. 20460
RCRA Hotline 1-800-424-9346
CFC Hotline 1-800-296-1996
TSKA Hotline (202) 554-1404

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- _____. 1992b. *Are There Hazardous Wastes In Your Home?, MT 9205 (HR)*. Bozeman, MT: Montana State University.
- _____. 1992c. *Dealing With Used Motor Oil And Other Auto Wastes, MT 9218 (HR)*. Bozeman, MT: Montana State University.
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- _____. 1992e. *The Hazard Free Home*. Bozeman, MT: Montana State University.
- Pennsylvania Department of Environmental Resources. 1989. *Guidelines For Household Hazardous Waste Collection Programs*. Harrisburg, PA: Pennsylvania Department of Environmental Resources.

United States Environmental Protection Agency. 1989a. *How To Set Up A Local Program To Recycle Used Oil*, EPA/530-R-92-039A. Washington, D.C.: U.S. Government Printing Office.

_____. 1989b. *Recycling Used Oil: What Can You Do?*, EPA/530-SW-89-039B. Washington, D.C.: U.S. Government Printing Office.

_____. 1989c. *Recycling Used Oil: 10 Steps To Change Your Oil*, EPA/530-SW-89-039B. Washington, D.C.: U.S. Government Printing Office.

_____. 1989d. *Recycling Used Oil: For Service Stations And Other Vehicle Service Facilities*, EPA/530-SW-89-039D. Washington, D.C.: U.S. Government Printing Office.

_____. 1992a. *Household Hazardous Waste Management: A Manual For 1-Day Community Collection Programs*, EPA/530-R-92-026. Washington, D.C.: U.S. Government Printing Office.

_____. 1992b. *Household Hazardous Waste: Steps To Safe Management*, EPA/530-F-92-031. Washington, D.C.: U.S. Government Printing Office.

_____. 1992c. *Used Dry Cell Batteries: Is A Collection Program Right For Your Community?*, EPA/530-K-92-006. Washington, D.C.: U.S. Government Printing Office.

Washington Toxics Coalition, Metrocenter YMCA, and King County Cooperative Extension. 1991. *Hazard Free Home: A Home Tour For Toxic Products*. Seattle, WA.

APPENDIX A

HHW EXAMPLES, HAZARDOUS PROPERTIES, INGREDIENTS, AND ALTERNATIVES

EXAMPLES OF HOUSEHOLD HAZARDOUS WASTES, THEIR HAZARDOUS PROPERTIES, INGREDIENTS, AND ALTERNATIVES

<u>PRODUCTS</u>	<u>HAZARDOUS PROPERTIES</u>	<u>HAZARDOUS INGREDIENTS</u>	<u>ALTERNATIVES</u>
<u>Cleaners</u>			
Silver Polish	Causes burns, toxic	Acidified thiourea, sulfuric acid	Soak in boiling water with baking soda, salt, and piece of aluminum foil; polish with toothpaste
Oven Cleaner	Causes burns, toxic	Potassium or sodium hydroxide, ammonia	Scrub with baking soda and water paste; use steel wool; sprinkle with salt while still warm
Toilet Cleaner	Irritant, causes burns, toxic	Muriatic (hydrochloric) or oxalic acid, paradichlorobenzene, calcium hypochlorite	Use toilet brush and baking soda or mild detergent; soak with white vinegar
Disinfectants	Causes burns, toxic	Diethylene or methylene glycol, sodium hypochlorite, phenols	One-half cup of borax in 1 gallon of boiling water; white vinegar
Drain Cleaner	Causes burns, toxic	Sodium or potassium hydroxide, sodium hypochlorite, hydrochloric acid, petroleum distillates	Plunger; metal snake; put ¼ cup baking soda down drain followed by ¼ cup vinegar, flush with boiling water
Rug and Upholstery Cleaners	Irritant, causes burns, toxic	Naphthalene, perchloroethylene, oxalic acid, diethylene glycol	Sprinkle dry cornstarch or baking soda on rug and vacuum
Polishes	Flammable, toxic	Diethylene glycol, petroleum distillates, nitrobenzene	Use 1 part lemon juice to 2 parts linseed oil, toothpaste to remove water stains
Bleach Cleaners	Causes burns, toxic, strong oxidizer	Sodium or potassium hydroxide, hydrogen peroxide, sodium or calcium hypochlorite	½ cup white vinegar, baking soda, or borax per laundry load
Mothballs	Toxic	Naphthalene, paradichlorobenzene	Put cedar chips or lavender flowers in drawers; wrap clothing in newspapers
Powder or Abrasive Cleaners	Causes burns, irritant, toxic	Trisodiumphosphate, ammonia, ethanol	Rub area with half a lemon dipped in borax and rinse; scrub with baking soda and borax; use elbow grease
Spot Removers	Toxic, flammable	Solvents	Soak in club soda; apply mixture of corn meal and water then rinse with lemon juice before washing
Window Cleaners	Toxic	Solvents	Rub windows with newspapers; use vinegar and water mixture
<u>Automotive Products</u>			
Antifreeze	Toxic	Ethylene glycol	Recycled antifreeze; propylene glycol
Transmission Fluid	Flammable, toxic	Hydrocarbons, mineral oils	Recycled transmission fluids
Brake Fluid	Flammable, toxic	Glycol ethers, heavy metals	Unknown
Used Motor Oil	Combustible, toxic	Hydrocarbons including benzene, heavy metals	Recycled or rerefined motor oil

PRODUCTS

HAZARDOUS PROPERTIES

HAZARDOUS INGREDIENTS

ALTERNATIVES

Paint Products

Enamel or Oil based Paints

Flammable, toxic

Pigments, ethylene, aliphatic hydrocarbons, mineral spirits

Latex or water based paints; avoid aerosol sprays

Latex or Water based Paints

Flammable

Resins, glycol ethers, esters, pigments, phenyl mercuric acetate

Limestone based white wash or casein based paint; avoid aerosol sprays

Rust Paint

Flammable, toxic

Methylene chloride, petroleum distillates, toluene

Unknown

Thinners and Turpentine

Flammable, toxic

N-butyl alcohol, acetone, methyl isobutyl ketone, petroleum distillates

Use water with water based paints

Furniture Strippers

Flammable, toxic

Methylene chloride, acetone, methyl ethyl ketone, alcohols, xylene, toluene

Sandpaper, steel wool, heat gun

Wood Preservative

Flammable, toxic

Chlorinated phenols, copper or zinc naphthenate, cresote, magnesium fluorosilicate

Water based wood preservatives

Stains and Finishes

Flammable, toxic

Mineral spirits, glycol ethers, ketones, halogenated hydrocarbons naphtha

Latex paint, water based finishes; natural earth pigment finishes

Pesticides and Herbicides

Fungicides

Toxic

Captan, folpet, anilazine, zinc/copper compounds

Do not overwater; keep areas clean and dry; aerate soil

House Plant Insecticides

Toxic

Methoprene, malathion, tetramethrin, carbaryl

Mix 2 Tbsp. dish soap with 2 cups water, spray on leaves

Garden Insecticides

Toxic

Parathion, Malathion, Chlorpyrifos, Dichlorvos

Remove plant from garden; insecticidal soap; import predators such as ladybugs and praying mantis; weed garden

Flea Collars and Sprays

Toxic

Carbamates, pyrethrins, organophosphates

Herbal collar/ointment (eucalyptus or rosemary); ½ tsp. Brewer's yeast/pound of pet weight daily

Roach and Ant Killer

Toxic

Organophosphates, carbamates, pyrethrins

Roaches: use traps or boric acid/powdered sugar mixture
Ants: sprinkle around red chili powder to hinder entry

Rat and Mouse Poison

Toxic

Brodifacoum, coumarins, strychnine

Live traps; remove food supply; chopped bay leaves

Herbicides

Toxic

Glyphosate, prometon, 2,4-D

Strong hoeing or hand weeding, keep grass short

Reference:

The Household Hazardous Waste Wheel by Environmental Hazards Management Institute, 1990.

MDHES does not warrant or guarantee the accuracy or the sufficiency of the information provided

APPENDIX B
ADDITIONAL RESOURCES

Solid Waste MANAGEMENT

MT 9120 (HR)

Alternatives to Hazardous and Hard-To-Dispose-Of Household Products

by Michael P. Vogel, Ed.D.

Montana State University Extension Solid Waste Education Coordinator

Too often today, we look for the quickest and easiest solutions to our daily chores. We have come to depend upon products and chemicals that are hazardous to the environment and difficult to dispose of — solvents, pesticides, and many cleaning products. Other problem-creating products include hobby materials (chemistry sets, photo chemicals), used motor oil, gasoline, and fireworks. A careful inventory in your home may reveal a deadly array of such substances.

What Is a "Hazardous" Household Product?

A "hazardous substance" is defined in federal government regulations as one which may cause personal injury or illness during any customary or reasonably foreseeable handling or use. There are two categories of hazardous household products and two specific sets of federal regulations for their labels:

1. Products containing pesticides which are toxic, regulated by the Federal Insecticide, Fungicide, and Rodenticide Act; and
2. Products containing hazardous substances (other than pesticides), which can be toxic, corrosive, irritant, flammable or radioactive, regulated by the Federal Hazardous Substances Act.

Because of America's growing landfill crisis, toxicity is the major concern of household hazardous products. But hazardous household products can also pose a threat to your immediate health since misuse can lead to accidental poisoning. Long term or cumulative problems in landfills and contamination of drain fields and septic systems as well as surface and groundwater can also occur.

How Do You Know If You're Using a Hazardous Product?

Read the label. Many household products used for cleaning, car care or yard care can be toxic, corrosive, flammable or reactive. All of those designations are considered hazardous. The signal word "DANGER" will

appear on substances which are extremely flammable, corrosive or highly toxic. Substances which are highly toxic must include the additional word "POISON." The signal word "WARNING" or "CAUTION" is used on all other hazardous substances.

Where Are Hazardous Wastes in My Home?

The hazardous wastes in your home may eventually end up in landfills and in Montana's water supply.

Home Checklist

Where to Look

- ✓ Basement
- ✓ Garage
- ✓ Bathroom
- ✓ Storage shed
- ✓ Utility room
- ✓ Kitchen
- ✓ Laundry room

Cleaning Products

- ✓ Drain, toilet and window cleaners
- ✓ Cleaning solvents and spot removers
- ✓ Septic tank cleaners
- ✓ Disinfectants
- ✓ Bleach and ammonia
- ✓ Oven cleaners

Hobby and Health Care Products

- ✓ Glues and cements
- ✓ Artist's paint and inks
- ✓ Waterproofers
- ✓ Photographic chemicals
- ✓ Medicines
- ✓ Some hair care products and cosmetics

Paint and Building Products

- ✓ Paint thinners, strippers and solvents
- ✓ Spray cans
- ✓ Lacquers, stains, varnishes
- ✓ Wood preservatives
- ✓ Asphalt and roof tar
- ✓ Acids for etching
- ✓ Latex and oil-based paints

Automotive products

- ✓ Antifreeze
- ✓ Rust inhibitor, remover
- ✓ Solvents
- ✓ Used motor oil
- ✓ Gasoline
- ✓ Brake and transmission fluid
- ✓ Battery acid
- ✓ Polishes and auto paints

Gardening and pest control products

- ✓ Sprays and dusts ✓ Ant and rodent killers
- ✓ Flea powder ✓ Weed killers
- ✓ Banned pesticides ✓ Fertilizers

What Can You Do?

- Buy products only in the quantity you need.
- Use products as directed
- Use products up completely before buying more
- Try to give leftovers to neighbors, businesses or organizations who will use them properly for their intended purposes.
- Recycle used motor oil and auto batteries.
- Dispose of chemical solids in original containers whenever possible.
- Keep chemical wastes away from children and pets.
- Use non-hazardous alternatives whenever possible.
- Replace chemical cleaners with "elbow grease."

Think Before You Throw It Away

- Do not dispose of liquid chemicals, banned pesticides, batteries or motor oil in the trash. Contact the Montana Department of Agriculture for information on disposing of banned products.
- Do not bury containers or leftover chemical products in your yard or garden.
- Do not burn containers of leftover chemicals.
- Never reuse pesticide or chemical containers for other purposes. Residues remain that contaminate other materials subsequently placed in the container.
- Avoid using aerosol cans.
- Do not pour used oil or liquid chemicals on the ground.
- Do not use storm sewers for chemical waste disposal.
- Do not mix chemical wastes together.

Alternatives to Hazardous Household Products

What did we do before we had today's convenient detergents, polishes and other household products? Most homemakers made their own potions to clean the home, using common "general store" items.

Today, too, we can create our own products. However, it is important to remember that years ago home remedies were created because few commercial choices existed. The do-it-yourself products we conjure up for ourselves are not neces-

sarily better or safer than those created by professional chemists in industry. Before making your own substitutes, check your local stores for environmentally safe products. Most manufacturers are also concerned about the effect their products have on the environment.

What Are the Tradeoffs?

Time and some convenience are the primary tradeoffs. In days past, the sink was scrubbed with baking soda. Extra effort was needed to maintain a stain-free sink. Wood floors were cleaned with oil and vinegar or just mineral oil. This eliminated the need for wax, but required more work. Today, most households still contain safe products to do the job currently being done by a hazardous product.

The following lists offer suggestions for alternatives to hazardous and hard-to-dispose-of household products which can be made up of easily obtainable substances. Although not infallible, these methods have been found to be effective and economical. You may even find that they produce a more desired effect than the methods you currently use.

Caution: Although these compounds may be kinder to the environment than some over-the-counter preparations, some may contain highly toxic ingredients. Keep out of reach of children. Some products, like chlorine bleach and ammonia, can react with each other to cause deadly fumes. Do not mix substances unless you know that they are absolutely safe together.

Personal Hygiene Product	Chart #1 Alternatives
Shampoo	Beat one egg yolk while gradually adding 1 cup water. Massage into hair and rinse.
Hair rinse	Lemon or vinegar rinse removes detergents and restores a proper pH balance.
Hair conditioner	Massage 2 teaspoons to 2 tablespoons natural yogurt throughout hair.
Bath salts	Use oils for dry skin, herbs for fragrance and relaxation, salt for cleansing and toning, starch to give skin sleekness, or milk (especially powdered) to soften skin.
Facial cleanser	Oatmeal cleans and softens without soap. Wrap in a cloth and use as washcloth.
Skin buffer	Pour olive oil in a cupped hand and add a few dashes of salt. Rub over skin, smoothing rough areas, and wait 5 minutes. Rinse off using oatmeal or soap.
Hand lotion	Combine ripe tomato, lemon juice, and glycerin in equal parts. Massage into skin and rinse with tepid water.
Toothpaste	Add enough water to baking soda to form a paste.
Mouthwash	A salt and water solution will eliminate germs and odors in mouth.
Note: Some researchers caution against using foods in personal hygiene products because they provide a breeding ground for bacteria.	

Chart # 2

Household Cleaner	Alternatives
Drain cleaner	Pour boiling water down drain. Two handfuls of salt followed by boiling water should clear pipes and help to avoid clogging.
Cleanser	For sinks, salt is an excellent scouring agent — and it also disinfects. For ovens and refrigerators, baking soda is a good cleanser and freshener.
Window, glass, plastic cleaners	Two tablespoons of vinegar in one quart of water works well. The concentration of vinegar to water can vary depending upon required cleaning.
Chrome, stainless steel polish	Dip damp cloth in flour and rub on surface of object.
Copper cleansing paste	Mix equal parts of salt and flour together. Heat an equal amount of vinegar, then combine ingredients to form a paste.
Hand laundry soap	Collect remnants of natural soap bars in a wide-necked jar to make an excellent soap-jelly. When the jar is just over half-full, pour boiling water to the brim. Let it sit mixing and blending (you can give it a stir to help the process along).
Marble cleanser and polish	Cut a fresh lemon in half. Fold within a cloth, dip edge into warm water and then borax. Rub marble surface, then buff with soft, dry cloth.
Silver polish	Soak silver in 1 quart warm water containing 1 teaspoon baking soda, 1 teaspoon salt and a piece of aluminum foil.
Brass-cleanser and polish	Mix equal parts of salt and flour. Add enough vinegar to make a stiff paste. Cover surface and allow to dry, then quickly rinse off.
General furniture polish (don't use on waxed furniture)	$\frac{1}{2}$ cup vinegar, $\frac{1}{2}$ cup rubbing alcohol, 1 cup linseed oil. Shake well before each application. Use a thin coating and test in a small area before total application. Also try 1 teaspoon lemon oil in one pint mineral oil.
Leather cleanser for accessories or furniture	Carefully bring 1 cup linseed oil to a boil. Remove from heat and allow to cool. Add 1 cup vinegar and mix well.
Mildew Remover	Chlorine bleach. (This could be more dangerous than some commercial products. Use with ventilation and do not mix with ammonia or acid products.)
Deodorizers	Alternative Suggestions
Smoke odor deodorizer	A bowl filled with white vinegar placed next to stove lessens cooking odors and smoke. Also helps eliminate cigarette odors when placed throughout a room.
Paint fumes deodorizer	Chop up one large onion and place in bucket of water in middle of room.
Refrigerator deodorizer	Keep open box of baking soda inside refrigerator.
Bathroom deodorizer	For quick elimination of noxious odors in bathroom, light a match to burn off gases. CAUTION: Keep matches out of children's reach. Scented candles work well, also.

Personal Hygiene (see Chart #1)

Our hair and skin often suffer from the many detergents we use on them. Some of us counteract these results with conditioners and moisturizers. Many items found within the home can produce a satisfying, healthy daily cleaning routine. However, many of the alternatives suggested in Chart #1 use food products which may be a breeding ground for bacteria.

Household Cleaners (see Chart #2)

Many common household cleaning products contain dangerous ingredients. Disposed of improperly, they could threaten your family's health or damage the environment. Caustic chemicals such as those found in oven cleaners (lye, sodium hydroxide), drain cleaners or

scouring powder can cause burns and severe damage to the skin and eyes. Furniture polish, silver cleaners, paint remover and wood floor wax contain solvents—fast-drying substances that dissolve another substance. Inhalation of vapors or accidental swallowing of the substance can be harmful or even fatal. Long-term exposure to some solvents may cause liver and kidney problems, birth defects, central nervous system disorders and cancer.

Aerosol Sprays (see Chart #3)

Aerosols are made up of one-half active ingredient and one-half liquid or gaseous propellant under pressure. Some contain organic solvents to dissolve or suspend substances—petroleum distillates, toluene, chlorinated hydrocarbons and ketones. Mist particles from

Chart # 3	
Aerosols	Alternatives
Deodorants	Roll-ons, creams, sticks, pump type sprays.
Hair spray	Setting lotions, gels, pump type sprays.
Shaving cream	Brush and shaving soap.
Air fresheners	Ventilate room; place box of baking soda in enclosed areas; set out vinegar in open dish; use fresh flowers and herbs; add cloves and cinnamon to boiling water, let simmer.
Disinfectants	1/4 cup bleach to one quart warm water; air out bedding; keep bathrooms dry.

Chart # 4	
Hazardous Product	Alternatives/ Disposal Recommendations
Motor Oil	None/Recycle at service station or local oil recycling center.
Transmission, brake fluid	None/Recycle same as above.
Antifreeze	None/Recycle as above. Or if on a city water system and permitted to do so, wash down drain with lots of water. DO NOT dispose of antifreeze in septic tank.
Car batteries	None/Trade in or take to special recycling center.
Paint	None/Use water-based latex paint if possible. Avoid aerosol sprays. For proper disposal, let evaporate, then wrap residue and place in garbage. Old, lead-based paints should not be used—take to a hazardous waste collection program if possible.
Lacquer, varnish, stripper, thinner, turpentine	Use according to directions, strain and reuse thinners and turpentine; always keep covered to avoid evaporation and take leftovers to hazardous waste collection site.

the aerosol enter the lungs and then the bloodstream. Aerosol cans are also potentially explosive and dangerous not only to you, but also to sanitation workers.

Automotive and Paint Products (see Chart #4)

Most automotive and paint products are dangerous because they contain poisonous chemical compounds, such as lead, acid or solvents. They also can be flammable. There are few alternative products, so proper use and disposal becomes a high priority for safety.

Pesticides, Herbicides, Rodenticides (see Charts #5, 6 and 7)

Pesticides contain a range of poisons which may cause serious damage to people, pets and wildlife if improperly used.

For home use, common sense and a little extra care around the house and garden can reduce or eliminate pests and weeds without chemicals. For example, keep a clean garden by removing dead leaves, debris, wood and weeds; remove and destroy infected plants; use barriers

Chart # 5	
	Alternatives to Try
House plant pesticides	Apply soapy water to leaves, rinse.
Garden pesticides	Use biological controls, such as lady beetles for aphid control.
Herbicides	Hand-pull weeds or mulch generously; cover garden with plastic in fall to prevent weed seed germination; cultivate with a hoe.
Rodent bait	Get a cat. Use a trap.
Insect repellent	Put up screens. Wear protective clothing. Some commercial bath oils repel insects.
Fertilizers	Use peat moss or compost. Use organic fertilizers containing blood or fish meal (high in nitrogen) or bone meal (high in phosphorous).
For Specific Insect Pests	
Moths (balls)	Use cedar chips or dried lavender.
Moths (Pomander)	Stick cloves into surface of apple or orange until completely covered. Cover with white tissue and let dry for two weeks in dry, airy place. Then unwrap and hang in closet. Cedar wood chips (or chests) also repel moths.
Roaches	Package food in roach-free containers. Sanitation is imperative.
Ants	Caulk and seal holes where ants enter house.

and traps once you can identify specific pests; and encourage beneficial organisms like ladybugs, praying mantis, etc. (See charts on page 4 and below.)

In the Garden

The best way to keep a lawn weed-free is to keep it healthy. This requires proper watering and fertilization. There are many types of grasses and some adapt better in certain areas.

Earth-Saver Plants

The air within houses and office buildings can be up to five times more polluted than the outdoor air. According to a study by the National Aeronautics and Space Administration, one potted plant per 100 square feet of floor space can help purify and absorb chemicals from the indoor air, reducing "sick building syndrome" See Chart #8 for some good anti-pollutant green-leaf choices.

Chart # 6	
Insect Problem	Alternatives to Try
Cockroaches and ants	Fill cracks around shelves, cupboards, sinks and bathtubs with caulking, putty or paint. Eliminate dripping water and piles of old newspapers. You can sprinkle equal parts of confectioners sugar and borax in dry area where ants or cockroaches are found, BUT ONLY IN AREAS INACCESSIBLE TO CHILDREN OR ANIMALS. Boric acid is toxic. Do not apply in areas where food is stored or eaten. Sticky traps are also available.
Mealy bugs or scales on houseplants	Apply alcohol or oil directly to the colonies with a small paintbrush.
Other houseplant pests	Wash leaves with soapy water (use non-detergent soap), then rinse.

Chart # 7	
Problem to Be Controlled	Suggested Methods
Aphids	Protect ladybeetles and lacewings — they prey on many such garden pests.
Cabbage worms	Hand pick worms.
Slugs and snails	Pour beer in a flat receptacle and place below ground level in the infested area. Dispose of properly when slugs or snails have attached themselves to the bottom.
Squashbugs, snails, and wireworms	They will attach themselves to the bottoms of boards placed around perimeter of garden. Wireworm and snails also are attracted to potatoes and will attach to the insides of hollowed out potato halves (scoop out the inside to form an igloo).
Crabgrass	A teaspoon or less of salt placed in the center of the individual plant will kill it.
Other ways of coping:	
Physical deterrents	Tar paper stapled to form a cylinder placed around the base of an affected plant will deter many pests. Wood ashes can deter borers that attach to trees — add enough water to form a paste and apply to the bottom of the tree.
Weeding	The most practical and beneficial way to eliminate weeds is to hand-pull them. The best time of year to weed is spring. For large patches or tedious weeding, anchor sections of black plastic around weeded area for 7-10 days. After removing dead weeds, sprinkle with grass seeds. Hand-harvesting also is the best method for removing weeds from ponds or lakes and can even be done professionally.

Chart # 8		
Pollutant	Sources	Solutions
Formaldehyde	Foam insulation, plywood, paper goods, household cleaners, carpeting, furniture	Philodendron, golden pathos, spider plant, bamboo plant, corn plant, chrysanthemum
Benzene	Tobacco smoke, gasoline, synthetic fibers, plastics, inks, oils, detergents, rubber	English ivy, marginata, Janet Craig chrysanthemum, gerbera daisy, peace lily, warneckei
Trichlorohylene	Inks, paints, varnishes, dry cleaning solvents	Gerbera daisy, chrysanthemum, peace lily, marginata, warneckei

Folk Remedies

There are a number of popular folk remedies recommended in some circles as alternatives to hazardous pesticides. We know of little or no scientific research that confirms effectiveness. If you try any of these, please let the author know if they work or not. (Write to Mike Vogel, MSU Extension Service, Bozeman, MT, 59717 or phone 406-994-3451.)

Garden pesticides: Try $\frac{1}{4}$ cup cayenne pepper in 1 pint water and spray on garden plants.

Rodent repellent: Sprinkle chopped bay leaves and cucumber skins around cracks and crevices.

Insect repellent: Drink brewer's yeast (if you are not allergic to it). Plant tansy around occupied areas or use lavender oil on your skin.

Cockroach repellent: Try a mixture of chopped bay leaves and cucumber skins.

Flies: Mint plants set on window sills help to repel flies.

Aphids: Garlic, chives, petunias, and nasturtiums repel aphids.

Cabbage worms: Tansy, rosemary and tomato help repel cabbage worms

Organic pesticide: Chop 3 ounces garlic bulbs and soak them in 2 teaspoons mineral oil for 24 hours. Slowly add one pint of water in which 2 ounces of oil-based natural soap has been dissolved and stir well. Squeeze this liquid through gauze and store in a tightly-sealed jar. Dilute 1 part garlic mixture to 20 parts water in sprayer.

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Solid Waste MANAGEMENT

MT 9205 (HR)

Are There Hazardous Wastes in Your Home?

by Michael P. Vogel, Ed.D.
Montana State University Extension Housing Specialist

Are there hazardous wastes in your home? Yes, there are! As a matter of fact many products found in your kitchen, bathroom, or garden shed are potentially hazardous substances.

In terms of actual volume, household hazardous waste would not appear to be a critical problem. A Los Angeles study found only 2.69 pounds of household hazardous waste per ton of garbage. Households produce only about two percent of the hazardous materials that are discharged into the environment, but the issue is not the volume of waste generated, it is the dispersion of hazardous waste. Scientists who track these data tell us that 98 percent of the generators of hazardous waste are households and farms. Therefore, the dispersion of hazardous wastes from households is extremely pervasive.

What is a Household Hazardous Material?

Hazardous materials may be gases, liquids, semi-solids or solids. They can pose a threat to the environment or your health if they are improperly used, stored or discarded. The threat is judged by measuring specific chemical characteristics of a substance. A substance exceeding a specific limit for one or more of the following characteristics is considered hazardous:

- How easily it catches fire (e.g., gasoline)
- How acidic or caustic it is (e.g., oven cleaner)
- How toxic long and short-term exposures are to humans and animals (e.g., pesticides, antifreeze)
- How easily toxic contaminants leach from it (e.g., waste motor oil, paint strippers)
- How explosive or reactive it is with water, heat or pressure (e.g., aerosol cans)

- How much oxygen or other gas it adds to a fire (e.g., hydrogen peroxide)

How to Identify a Household Hazardous Product

You can generally identify hazardous products from their labels. Look for product names that could indicate a hazard (pesticide, herbicide, insecticide, fungicide, caustic, acid, ammonia, solvent). Look for any of the following words on a product label:

- | | |
|--|---------------------------------|
| • Avoid inhaling | • Poison |
| • Caustic | • Radioactive |
| • Caution | • Reactive |
| • Combustible | • Strong sensitizer* |
| • Corrosive | • Toxic |
| • Danger | • Use with adequate ventilation |
| • Do not store near heat or open flame | • Volatile |
| • Explosive | • Warning |
| • Flammable | • Wear gloves |
| • Irritant | |

These and similar clues on the label will indicate a hazardous substance is present and alert you that careful use and disposal practices are required.

Effects of Household Hazardous Products

Hazardous products present two types of dangers to health and the environment: acute and chronic. Acute effects are immediate and characterized by severe symptoms with a sudden onset. Skin burns and disfigurement from splashing battery acid, fire caused by an exploding aerosol can stored too close to the stove, or an overnight fish kill resulting from dumping

**A sensitizer could cause a person to display varying degrees of allergic sensitivity, i.e. skin rash, respiratory distress, etc.*

toxicants down the storm sewer are examples of acute dangers caused by hazardous products.

Chronic effects are gradual and occur through repeated exposure over an extended period of time. Allergic reactions that occur each time you open the cupboard where the fragrant cleaning products are stored, or the slow pollution of groundwater resulting from the disposal of small amounts of leftover herbicide down the sink every growing season are examples of chronic dangers caused by hazardous substances. There are also many kinds of chronic health effects. Some of the most common are liver or kidney damage, central nervous system damage, cancer, and birth defects.

Check Your Home for Hazardous Products!

Following is a list of household products, the product's common hazardous constituents and the possible health and/or environmental effects. Put a checkmark by products that you have. Note how much you have of each. As you go through the list pay special attention to:

- materials that may have been placed in a different container
- materials placed in a container without a label
- leaking containers
- improper storage of materials/containers
- containers with rust or crystals or powders forming

KITCHEN		
Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Scouring Powder	Chlorine	Fumes highly irritating to eyes and respiratory tract; deadly chloramine gas created if mixed with ammonia
Oven Cleaner	Sodium hydroxide or potassium hydroxide	Extremely corrosive, burns skin and eyes; usually fatal if swallowed; aerosols disperse chemicals, increasing inhalation dangers
Ammonia	Ammonia	Fumes irritate eyes and lungs; can cause burns or rashes on skin; can produce deadly chloramine gas if mixed with chlorine-containing products
Floor Cleaner	Pine oil Petroleum distillates (in liquid type polish) Naphtha (in paste type polish)	Irritates eyes and mucous membranes Irritates skin, eyes, respiratory tract; may cause fatal pulmonary edema; flammable Inhalation causes drowsiness, headache, coma and cardiac arrest; irritate eyes, throat and skin
Metal Polish	Naphtha Oxalic acid	Inhalation causes drowsiness, headache, coma and cardiac arrest; irritate eyes, throat and skin Damages kidneys and liver; irritates eyes and respiratory tract; corrodes mouth and stomach
Roach Killer	Organophosphates Carbamates	Carcinogenic in rats; teratogenic in chick embryos; affect nervous system; acutely toxic causing headache, dizziness, twitching, nausea Carcinogenic in rats; mutagenic; teratogenic in dogs and mice; affects nervous system
Rodent Killer	Warfarin	Causes internal bleeding if ingested in large amounts; toxic to fish

BATHROOM

Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Drain Opener (powder or liquid)	Sodium hydroxide or potassium hydroxide Hydrochloric acid 1,2-Dichloro-5,5-dimethyldantoin	Extremely corrosive; burns eyes; usually fatal if swallowed Fumes are extremely corrosive; burns skin Forms hypochlorite in water, which is corrosive to skin and mucous membranes
Toilet Bowl Cleaner (powder) (Liquid)	Sodium bisulfate Oxalic acid 1,3-Dichloro-5,5-dimethyldantoin Hydrochloric acid Phenols	Forms sulfuric acid, which is corrosive, burns skin Damages kidney and liver; irritates eyes and respiratory tract; corrodes mouth and stomach Forms hypochlorite in water, which is corrosive to skin and mucous membranes Fumes are extremely corrosive; burns skin Central nervous system depression; severely affects circulatory system; corrosive to skin; suspected carcinogen
Disinfectant	Pine oil Phenols Chlorine Cationic surfactants	Irritates eyes and mucous membranes Central nervous system depression; severely affect circulatory system; corrosive to skin; suspected carcinogen Fumes highly irritating to eyes and respiratory tract Irritate skin, eyes, and mucous membranes
Mildew Remover	Phenols Kerosene Pentachlorophenol	Central nervous system depression; severely affects circulatory system; corrosive to skin; suspected carcinogen Causes lung inflammation; dries skin Toxic to fetus and causes birth defects; toxic if inhaled, absorbed or ingested
Hair spray	Aerosol propellants Polyvinylpyrrolidone	Either associated with brain damage (nitrous oxide) or highly flammable (propane) Causes kidney & liver damage and cancer in test animals
Hair Color	Cadmium chloride Cobalt chloride Cupric chloride Lead acetate Silver nitrate	Extremely toxic, especially if inhaled as dust or aerosol Chronic toxicity affects liver and thyroid Acts on gastrointestinal tract Causes cancer in test animals Corrosive to skin, eyes and mucous membranes; may cause blindness; poisonous if ingested
Home Permanent	Ammonium thioglycolate	Causes skin rash and hemorrhages under skin; hypoglycemia has been associated with toxic exposure
Nail Polish	Toluene Xylene	Produces headache, nausea, narcosis, central nervous system depression Skin contact causes dermatitis; vapors are irritating; toxic to blood system of mammals
Nail Polish Remover	Acetone Ethyl acetate	Toxic if ingested; irritates lungs, causes nails to become brittle; flammable Irritating to eyes, nose and throat; anesthetic effects

LAUNDRY/UTILITY ROOM

Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Spot Remover	Perchloroethylene	Fumes are carcinogenic and acutely toxic, causing dizziness, sleepiness, nausea, loss of appetite and disorientation.
Starch	Formaldehyde	A suspected carcinogen and a strong irritant to the eyes, throat, skin and lungs
	Phenols	Central nervous system depression; severely affects circulatory system; corrosive to skin; suspected carcinogen
	Pentachlorophenol	Toxic to fetus and causes birth defects; toxic if inhaled, absorbed, or ingested
Bleach (Powder) (Liquid)	Chlorine	Fumes highly irritating to eyes and respiratory tract; causes deadly chloramine gas if mixed with ammonia
	Sodium tripolyphosphate	Irritating due to alkalinity
	Sodium hypochlorite	Corrosive to skin and mucous membranes; fumes irritating
	Hydrogen peroxide	Irritates skin
Moth Balls	Paradichlorobenzene	Vapor irritates skin, eyes and respiratory tract; large doses can cause injury to liver; suspected carcinogen
	Naphthalene	Damages liver; prolonged vapor exposure has led to cataract formation
Furniture Polish	Petroleum distillates	Irritate skin, eyes, respiratory tract; may cause fatal pulmonary edema; flammable
	Oil of cedar	Central nervous system depressant; may induce spontaneous abortion
Carpet/Upholstery Shampoo	Perchloroethylene	Fumes are carcinogenic and acutely toxic, cause dizziness, sleepiness, nausea, loss of appetite and disorientation
	Naphthalene	Damages liver; prolonged vapor exposure has led to cataract formation
	Chlorinated solvents	Central nervous system depressants, irritants, vary in toxicity

GENERAL HOUSEHOLD ITEMS

Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Air Freshener	Formaldehyde	A suspected carcinogen and a strong irritant to the eyes, throat, skin and lungs
	Petroleum distillates	Irritates skin, eyes, respiratory tract; may cause fatal pulmonary edema; flammable
	p-Dichlorobenzene	Vapor irritating to skin, eyes and throat, causes liver damage in animal studies
	Aerosol propellants	Either associated with brain damage (nitrous oxide) or highly flammable (propane)
Glass Cleaner	Ammonia	Fumes irritate eyes, lungs; can cause burns or rashes on skin
	Isopropanol	Irritates mucous membranes; ingestion results in drowsiness, unconsciousness and death
Flea Collar, Shampoo, Spray, Powder	Organophosphates	Carcinogenic in rats, teratogenic in chick embryos; affects nervous system; acutely toxic causing headache, dizziness, twitching, nausea
	Carbamates	Carcinogenic in rats; mutagenic; teratogenic in dogs and mice, affects nervous system
Used Batteries	Nickel	Causes dermatitis, sensitizer
	Cadmium	Damages kidneys and lungs
	Mercury	Toxic mercury vapor can damage brain and nervous system

GARDEN SUPPLIES

Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Weed Killer	Various formulations	There are many types of herbicides and all are toxic; some persist in the environment; many cause skin irritation and can pass through the skin to the blood
Insecticides	Organophosphates	Carcinogenic in rats; teratogenic in chick embryos; affects nervous system; acutely toxic causing headache, dizziness, twitching, nausea
	Carbamates	Carcinogenic in rats; mutagenic; teratogenic in dogs and mice; and affects nervous system
No-Pest Strip	Dichlorvos	Mutagenic in bacterial cultures, teratogenic in rats but not in several other mammals. Also toxic to fish and bees and interferes with the nervous system
Insect Repellant	Butopyronoxyl	Can cause mild necrosis in liver and kidney
	Dimethyl phthalate and/or Ethohexadiol	Ingestion causes central nervous system depression; not absorbed by the skin
	Diethyltoluamide (Deet)	Irritant to sensitive skin and respiratory tract tissues

GARAGE/WORKSHOP

Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Oil-based Paints	Organic solvent	Irritating to eyes and skin, can cause cracking of skin and depression of nervous system
Paint Thinner	Toluene	Produces headaches, nausea, narcosis, central nervous system depression
	Turpentine	Irritant and skin allergen; vapors cause headache, confusion, respiratory distress
	Ethyl or butyl acetate (lacquer thinner)	Irritating to eyes, nose, and throat; anesthetic effects
	Mineral spirits	Irritates skin, eyes, respiratory tract; narcotic; flammable
Lacquer (Varnish)	Methanol	Damages the nervous system, liver, kidneys; inhalation can lead to lung disease, ingestion can cause blindness
	Ethanol	Ingestion causes intoxication, additives are poisonous
	Mineral spirits	Irritates skin, eyes, respiratory tract; narcotic; flammable
	Benzene	Destroys ability to produce blood cells, can cause leukemia; flammable; carcinogen
	Turpentine	Irritant and skin allergen; vapors cause headache, confusion, respiratory distress; combustible
Paint Stripper/ Finish Remover	Benzene	Destroys ability to produce blood cells, can cause leukemia; flammable; carcinogen
	Methylene chloride	Suspected carcinogen; vapors cause carbon monoxide accumulation in blood
	Toluene	Produces headache, nausea, narcosis, central nervous system depression
	Phenols	Central nervous system depression; severely affects circulatory system; corrosive to skin; suspected carcinogen
	Cresols	Corrosive to tissue, damages liver, kidneys, lungs, pancreas and spleen
Wood Preservative	Pentachlorophenol	Toxic to fetus and causes birth defects, toxic if inhaled, absorbed, or ingested
	Creosote	Vapors cause eye and nasal irritation, it is a skin carcinogen and can be absorbed through the skin
	Copper naphthenate	An eye, skin, and lung irritant, a possible carcinogen and affects the nervous system; combustible; harmful to aquatic life
Adhesives	Naphthalene	Damages liver, prolonged vapor exposure has led to cataract formation
	Phenol	Central nervous system depressant, severely affects circulatory system, corrosive to skin; suspected carcinogen
	Ethanol	Ingestion causes intoxication; additives are poisonous
	Vinyl chloride	Causes liver dysfunction, suspected carcinogen
	Formaldehyde	Suspected carcinogen and a strong irritant to the eyes, throat, skin and lungs
	Acrylonitrile	Damages liver and blood, can cause shock

AUTOMOTIVE SUPPLIES

Product	Common Hazardous Constituents	Possible Health and/or Environmental Effects
Used Motor Oil	Lead Hydrocarbons	Causes nerve and kidney damage, suspected carcinogen Some forms are carcinogenic
Antifreeze	Ethylene glycol	Poisons animals, who are attracted to the sweet smell; can cause damage to internal organs through skin absorption; inhalation can cause dizziness
Used Car Battery	Sulfuric acid Lead	Corrosive, causes severe skin burns, and can cause blindness Causes nerve and kidney damage, suspected carcinogen
Brake and Transmission Fluid	Glycols	Some compounds cause kidney damage
Engine Degreaser	Chlorinated solvents (methylene chloride, perchloroethylene, trichloroethane) Cresol Stoddard solvents (mineral spirits)	Central nervous system depressants, irritants, vary in toxicity Corrosive to tissue, damages liver, kidneys, lungs, pancreas and spleen Irritates skin, eyes and respiratory tract; narcotics; flammable
Carburetor Cleaner	Cresol Methylene chloride Sodium chromate	Corrosive to tissue, damages liver, kidneys, lungs, pancreas and spleen A suspected carcinogen; vapors cause carbon monoxide accumulation in blood Causes contact dermatitis
Gasoline	Gasoline Tetraethyl lead	Extremely flammable, combustible and toxic; vapors in an empty container are extremely dangerous Nerve toxin, small amounts are fatal
Windshield Washer Fluid	Methanol Ethylene glycol Isopropanol	Damages the nervous system, liver, kidneys, inhalation can lead to lung disease, ingestion can cause blindness Poisons animals who are attracted to the sweet smell; can cause damage to internal organs through skin absorption; inhalation can cause dizziness Irritates mucous membranes; ingestion results in drowsiness, unconsciousness and death
Fuel System Antifreeze	Methanol Isopropanol Toluene Xylene	Damages the nervous system, liver, kidneys, inhalation can lead to lung damage; ingestion can cause blindness Irritates mucous membranes; ingestion results in drowsiness, unconsciousness and death Produces headache, nausea, narcosis, central nervous system depression Skin contact causes dermatitis, vapors are irritating, toxic to blood system of mammals

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C-2 (Household Hazardous Waste)
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Solid Waste MANAGEMENT

MT 9207 (HR)

Household Hazardous Waste — Disposal Recommendations

by Michael P. Vogel, Ed.D.

Montana State University Extension Service Solid Waste Education Coordinator

All homes contain products that are hazardous to people or the environment when disposed of improperly—oven cleaner, drain cleaner, mothballs, metal and wood polishes, motor oil, turpentine, insect sprays, and weed killers, to name just a few. These products contain the same chemicals that industry is required to dispose of in an approved hazardous waste disposal site. However, as yet there is little regulation of the disposal of hazardous household products. It is up to each of us to minimize hazardous wastes and dispose of them responsibly.

Why the disposal concern?

When a consumer disposes of a hazardous household product, it is likely to end up either in a landfill or incinerator as garbage, or at a waste water treatment facility if it is dumped down the drain or flushed. Unfortunately, sewage treatment plants, septic systems, and most landfills are not designed to handle hazardous chemicals, and they soon end up in the environment. Sometimes these products enter the environment directly through storm drains and gutters where people pour them without thinking of the consequences.

A combination of public awareness and proper management will help remove these materials from the waste stream before they reach the landfill, incinerator, treatment plant or the environment. The first step is to recognize hazardous materials in your home, limit their use, or find safer alternatives. To help you with these steps, the MSU Extension Service has prepared these waste management publications: *Are There Hazardous Wastes in Your Home?* (MT 9205), and *Alternatives to Hazardous and Hard-to-Dispose-of Household Products* (MT 9120).

Disposal of household hazardous wastes—general guidelines

- Switch to non-hazardous alternatives if available.
- Buy smaller quantities—only what you can use up.
- Recycle whenever possible—give leftovers to a friend or neighbor who can legitimately use them.
- Be aware of the uses and dangers of products and always follow the directions carefully. If directions are unclear, contact the manufacturer or dealer before using.
- Keep unused products in their original containers so that you can refer to directions for use and proper disposal. Always store in a safe, dry place.
- Do: Wrap *empty* container in several layers of newspaper and dispose of with other household garbage.
- Do: Keep all chemical waste out of reach of children and pets.
- Do: Call the Montana Department of Health and Environmental Sciences, Solid and Hazardous Waste Program, (406) 444-1430, if you want to dispose of a product and you aren't sure how to do so.
- Don't Bury containers or leftover chemicals or products in your yard or garden.
- Don't Burn containers or leftover chemicals.
- Don't Dispose of liquid chemicals with household garbage.
- Don't Reuse pesticide and chemical containers.
- Don't Mix wastes together.

Specific disposal guidelines

The best disposal method is to use up the product yourself or give it to someone else who can use it. However, when this is not possible, some products may, with precautions, be disposed of in landfills, flushed down the drain or recycled.

Disposal options

Disposal option 1—recycling

Some hazardous materials can be recycled. Used motor oil and automotive batteries, for instance, contain substances which can be reclaimed and reused. Recycling can also mean giving your unwanted portions to someone who wants and will use the product. Paint is a good example: a theater group, church, or neighbor may need just the amount and color you no longer need. Leftover pesticides (which are not banned), some solvents, and photography chemicals are other examples of chemicals that may be recycled.

Disposal option 2—water dilution

There are many household consumer products—for example, tub and toilet cleaners, laundry and dish detergents, hand soap—that go down the drain during normal use. These products have been designed for disposal through sewer or septic systems. To dispose of leftovers of these products, pour down the drain and dilute with large amounts of water.

Dilution disposal is appropriate when the hazardous waste is neutralized by water or when the municipal or sanitary sewage system is able to remove the toxins or render them harmless. Heavy concentrations of certain chemicals in a septic tank, however, can slow down or destroy the microorganisms which make the system work properly. If you have a septic system, it is preferable to give hazardous waste acceptable for flushing to a friend who is on a sanitary sewage treatment system. If you have questions about what your sewer or septic system can handle, call the local sanitation or health department.

Precautions to take when flushing hazardous waste down the drain include:

- never pour waste in drains that lead directly into waterways
- avoid chemical disposal in food preparation areas
- use ventilation and wear gloves and goggles when pouring chemicals
- never mix chemicals together while pouring into a toilet or sink.

In addition to the products listed above, small quantities of hazardous wastes that can be flushed down the drain are:

- aftershave
- windshield wiper fluid
- antifreeze
- medicine (expired)

- deodorizers
- tile and tub cleaners
- drain openers
- hair removers/relaxers
- glass cleaners
- disinfectants
- bleach
- lye base paint stripper
- rug shampoo
- toilet bowl cleaner
- rust remover (with phosphoric acid)
- ammonia and ammonia based cleaners
- isopropyl alcohol and alcohol-based lotions

Disposal option 3—trash disposal

When properly prepared, hazardous wastes can be safely discarded with your garbage destined for a sanitary landfill. This means you can throw them in the garbage. This does not mean you can burn or bury these wastes. Be careful about what you throw away. If you are unsure, call your waste handler. Hazardous wastes which are acceptable at some landfills include:

- auto body repair products
- empty aerosol cans
- crystallized oven cleaner
- shoe polish
- fertilizer without pesticides
- empty, triple-rinsed pesticide containers

Small amounts of many hazardous waste products can be solidified by air-drying or by mixing with absorbent material such as kitty litter, sawdust, charcoal or sand. If solidified, allowed to dry, and then double wrapped in plastic, these products may also be acceptable:

- adhesives and epoxies
- nail polish
- solvent-based cleaners
- oil and latex paints
- solvent-based polishes
- thinners

Disposal option 4—collection programs

To handle some hazardous products, some communities throughout the country have held collection days. Products that should be saved for disposal by a licensed hazardous waste handler include:

- automotive paint
- brake fluid
- dry cleaning fluid
- gasoline
- engine degreaser
- flea powder
- epoxies and adhesives
- herbicides
- wood preservatives
- mothballs
- photographic chemicals
- insecticides
- polishes containing nitrobenzene
- oil-based paint (large quantities)
- solvent-based paint stripper

Household hazardous waste collections, however, are very expensive and not often an option in rural areas. (In Montana, Missoula has held the only collection day—in 1984). Also, storing hazardous materials for long periods, waiting for a collection program, may pose a safety hazard. Containers stored over a long period of time may begin to leak chemicals and pose an indoor air quality or fire hazard.

Specific household hazardous products and disposal recommendations

If collection programs are not likely in your area, the United States Environmental Protection Agency's Hazardous Waste regulations specify the following disposal practices

Adhesives:

- auto-body filler
- caulking compounds
- glazing compounds
- joint fillers
- patching pastes
- spackling compounds
- tile grout
- carpet adhesives
- epoxy resins
- glues
- linoleum pastes
- rubber cement
- tile adhesive
- wood putty

Disposal recommendations

- Use up or store until you can use them.
- Donate to friend or organization.
- Check the label to determine whether the adhesive is solvent-based or water-based. Water-based adhesives can be disposed of at home by air drying (open container and let dry; if in a tube, slit the tube for drying; for larger amounts spread the adhesive in thin layers on cardboard to dry; for epoxy and other two-part adhesives, mix the two parts together to let them dry). Once the adhesive is hardened, it can be safely placed in the trash.
- Solvent-based adhesives are flammable and releasing the fumes to the air in the drying process can be a health and environmental hazard. Because of this, only very small quantities of solvent-based adhesives—less than eight ounces at a time—should be disposed of at home. For these small quantities, follow the drying instructions above.

Household pesticides

- herbicides (chemicals designed to kill plants)
- insecticides (chemicals designed to kill insects)
- rodenticides (chemicals designed to kill rodents)

Disposal recommendations

- Use them up! Rinse empty pesticide containers three times before throwing them in the trash and use the rinse water as a pesticide. Do not burn or reuse pesticide containers.
- Give them to someone who can reuse them:
 - city park departments
 - garden clubs
 - greenhouses and plant nurseries

Do not give away pesticides that are banned, unlabeled or damaged. Damaged pesticides include caked powders, liquids that have been frozen and pesticides that have been mixed with other products.

Most banned pesticides will contain one of the following ingredients. Check the product's label for:

- 2,4,5-T
- Aldrin
- Chlordane
- DDT
- Dieldran
- Endrin
- Silvex
- Sodium arsenate (more than 2%)
- Sodium cyanide
- Toxaphene

NOTE: This is not a complete list.

- Pesticides that are banned, damaged or unlabeled and all other pesticides that you can't use up must be taken to a household hazardous waste collection facility. Until a collection program is available, store the pesticides carefully:
- Be sure container is clearly labeled with the name of the pesticide
- Keep in locked closet or cabinet away from children or pets
- Keep the pesticide from freezing
- Store the pesticide in a dry area

Household solvents

- gas-line de-icers
- grease-stain removers
- machinery degreasers
- nail polish removers
- septic tank cleaners
- rubbing or wood alcohol
- gasoline additives
- paint stripper
- paint thinner
- paint remover
- spot removers

Disposal recommendations

- The best thing to do with leftover solvents is to use them up or store them for later use. Solvents are chemicals that dissolve other substances. Many solvents are poisonous when swallowed or absorbed through the skin and lungs, and most are flammable.
- If you cannot use your solvents, give them to someone who can.
- Paint thinner that has been used to clean up paint brushes and supplies can be cleaned and reused. Follow these easy steps:
 1. Pour the used thinner into a transparent container with a good seal and store it in an area away from children, pets and sources of heat or flame. In time, the dissolved paint will settle to the bottom of the container.
 2. When the paint has settled, carefully pour the clean solvent off the top—thinner can be reused.
 3. Pour the remaining paint sludge back into your oil-based paint. If you can't do this, you can allow the remaining paint sludge to dry completely.

Disposal recommendations for all other solvents

If you can't use the product up, or find someone else to use it, the only way to dispose of household solvents is through a household hazardous waste collection

program. Until a collection is held, store the solvent in its original labeled container, away from pets and children.

Household cleaners

- solvent-containing cleaners
- spot removers
- corrosive cleaners
- other cleaners

Disposal recommendations

Cleaners containing solvents should not be disposed of down a drain, in the trash or down a toilet. Very small quantities of these cleaners—less than one cup (eight ounces)—can be evaporated and disposed of in the trash.

- Pour an absorbent material such as cat litter or sand into a cardboard box lined with plastic.
- Mix the cleaner with the absorbent material and LET IT DRY.
- When the cleaner has evaporated, you can throw the absorbent material and the box into the trash.

Spot removers, because they contain chlorinated solvents, should NOT be evaporated because inhaling the chemical can be a serious health hazard.

Spot removers and more than one cup of other solvent-based cleaners should be taken to a household hazardous waste collection for proper disposal.

Very small quantities—less than one cup (eight ounces)—of corrosive household cleaners in liquid form and toilet bowl crystals can be flushed down the toilet with lots of water if your house is connected to a sanitary sewer (city sewer) system.

Cleaners that are not corrosive and do not contain solvents can be flushed into a sanitary sewer system if they are liquid, or thrown in the trash if they are solid. NEVER mix cleaners containing ammonia with those containing bleach—a very toxic gas will be produced.

Wood preservatives—disposal recommendations

- If your wood preservative does not contain creosote or pentachlorophenol, you can use the leftovers.

Creosote and pentachlorophenol-containing products, which have been restricted from consumer use since 1985, should be given to a trained user. Landscape companies, railroads, nurseries and wood-treating companies may have trained staff and may accept your leftovers.

- Wood preservatives that can't be used up should be taken to a household hazardous waste collection program for proper disposal. Store the chemicals with the lids tightly sealed, in an area away from children and pets.

Automotive wastes

- Used motor oil

Do not dump waste oil on the driveway, on the soil, into storm sewers or down the drain or toilet. Motor oil should be recycled. If you can't find a used oil collection site in your community, call your local highway

department, local full-service filling station, or the Montana Department of Health. If you cannot recycle your oil, solidify the oil and dispose of it with other household waste.

- Transmission fluid

If not contaminated with other products, used and unused transmission fluid may be accepted for recycling. Keep in separate container from used oil.

- Brake fluid

There is no safe way to dispose of brake fluid. Brake fluid should be disposed of by a licensed hazardous waste handler.

- Uncontaminated gasoline

Quantities of uncontaminated gasoline should be used up in an automobile or other engine. It is not recommended that it be used as a solvent (such as for cleaning tools) because this procedure is very dangerous and also contaminates the gasoline. It is difficult to dispose of contaminated gasoline, whereas kerosene, diesel fuel or other solvents for tool cleaning and related purposes can be mixed with waste oil for recycling.

The household hazardous waste wheel

For more details on disposal of household hazardous waste, the Montana State University Extension Service offers a unique diagnostic publication—the *Household Hazardous Waste Wheel*. The wheel examines 36 household hazardous materials and defines their hazardous ingredients, alternatives for their use, hazardous properties, and the proper waste disposal practice. The wheel is available for \$3.65 from county Extension offices.

References

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Guide to Hazardous Products Around the Home, Household Hazardous Waste Project, Springfield, MO, 1989.

Household Hazardous Waste fact sheet series, Minnesota Pollution Control Agency, September 1990

Household Hazardous Wastes, Delaware Department of Natural Resources and Environmental Control, Division of Air and Waste Management, Hazardous Waste Management Branch, August 1989.

Household Hazardous Wastes—Disposal Recommendations, Michigan State University Extension Service, E-1782, January 1987.

Household Waste Disposal: Learn How To Do It Right!, Chemical Specialties Manufacturers Association, Washington, DC, 1986.

File under: Solid Waste Management
C-3 (Household Hazardous Waste)
Issued March 1992 1853000392MS

Solid Waste MANAGEMENT

MT 9218 (HR)

Dealing With Used Motor Oil and Other Auto Wastes

compiled by Michael P. Vogel, Ed.D.
Montana State University Extension Service
Solid Waste Education Coordinator

Many of the products routinely used to keep automobiles running can be hazardous to the environment and human health. Oil, antifreeze, brake and transmission fluids, batteries, and tires are all basic needs of an automobile, but if improperly disposed of when worn out, they can have a harmful impact on the environment. This MontGuide will focus on automotive wastes and how to safely dispose of them.

Waste Oil

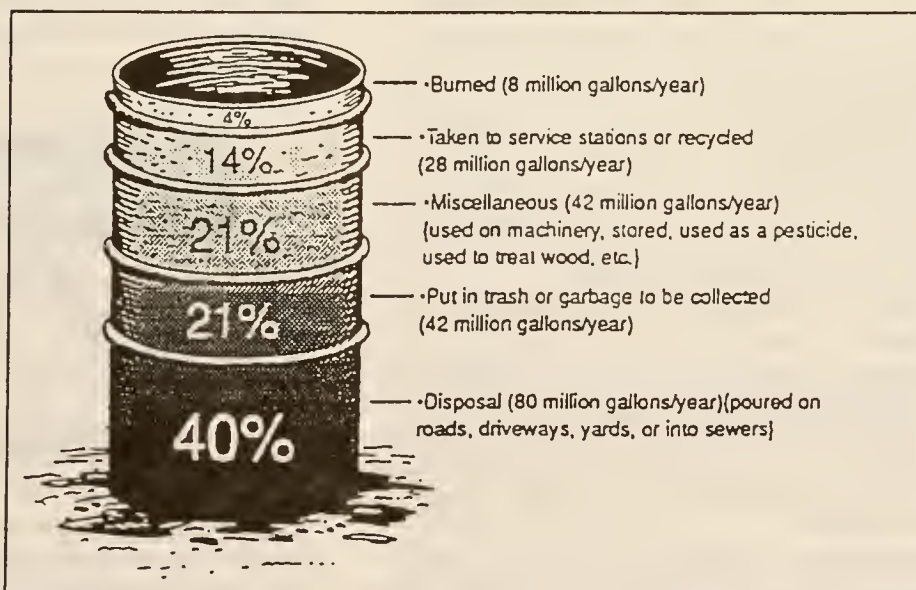
Oil recyclers like to say "Used oil doesn't wear out—it just gets dirty." Even though the oil in your car, truck, boat, or lawn mower has become dirty and worthless to you, the used oil can be cleaned up and used again.

According to the United States Environmental Protection Agency (U.S. EPA), about 200 million gallons of used car and light truck crankcase oil is generated by individual "do-it-yourself" consumers who change their own oil. Although all automotive oils can be reprocessed, unfortunately most do-it-yourselfers' used oil is handled improperly. In addition, businesses and industries improperly dump 260 million gallons of used oil each year. That's 24 times the amount of oil spilled off Alaska's coast by the Exxon Valdez oil tanker in 1989. Some of this oil is emptied into sewers, disrupting treatment plants, or goes directly into waterways. Some is dumped directly

onto the ground to kill weeds, or is used to suppress dust on dirt roads. There are also millions of gallons of used oil thrown directly into the trash, often ending up in landfills, from which oil can contaminate ground and surface water. Only 10 percent of used oil is properly collected and sent off for recycling.

Used Oil Facts

- After being used in your car's engine, oil has picked up concentrated levels of potentially toxic elements such as arsenic, barium, cadmium, chromium, lead, phosphorous, magnesium and zinc.
- One gallon of used oil from a single oil change can pollute a million gallons of fresh water—a year's supply for 50 people.



Estimate of disposition of do-it-yourself used oil in 1981

"Do-it-yourselfers" mismanage at least 61 percent of the oil they handle.

(NOTE: Some miscellaneous uses can also constitute mismanagement.)

Statistics source: Market Facts Inc., March 1981

- The Coast Guard estimates that sewage treatment plants discharge twice as much oil into coastal waters as do tanker accidents—15 million gallons per year versus 7.5 million gallons from accidents. A major source of this pollution is the dumping of oil by do-it-yourselfers into storm drains and sewers.

- Oil films on water surface can block sunlight and impair plant photosynthesis that increases oxygen for aquatic life.

- Re-refining used oil takes only about one-third the energy of refining crude oil to lubricant quality.

- If all used oil improperly disposed of by do-it-yourselfers was recycled, it could produce enough energy to power 360,000 homes each year or provide 96 million quarts of high quality motor oil.

Used Oil Do Not's¹

- **DO NOT pour used oil down a drain**

If the drain leads to a wastewater treatment plant, the oil could reduce plant efficiency, causing more contaminants to flow out of the plant's discharge pipes and into a nearby lake or stream. At its worst, oil clogs plant machinery and may cause an unscheduled shutdown. Repairs are an expensive and avoidable use of taxpayer dollars.

The effect is similar when oil is poured down a drain that leads to a septic system. The oil can hinder or stop the biological processes that make the septic system work.

- **DO NOT pour used oil into a storm sewer**

Storm sewers lead directly to lakes, streams and wetlands where oil spoils habitat for fish and wildlife, and interferes with swimming, boating and other recreation. Pouring oil down a storm sewer is illegal.

- **DO NOT toss used oil on the driveway, street or ground**

Such practices lead to soil pollution and, through percolation and runoff, can contaminate lakes, streams, wetlands and groundwater.

- **DO NOT spread oil to suppress dust or kill weeds**

These practices harm land and water resources.

- **DO NOT dispose of oil in lakes, streams or wetlands**

It's illegal and harmful to fish, wildlife and outdoor recreation.

- **DO NOT burn outdoors**

Burning oil in a backyard barrel can result in toxic smoke that contaminates the air you and others breathe. Many municipalities have ordinances that outlaw such burning.

¹Adapted from: *Recycle Used Oil*, Wisconsin Department of Natural Resources

Waste Oil Uses

Basically there are three uses for waste oil.

1. **Recycling or Re-refining:** Waste oil can be re-refined into fuel oil or lubricating oil. Recycling used oil would save the U.S. 1.3 million barrels of oil per day. One gallon of used oil provides the same 2.5 quarts of lubricating oil as 42 gallons of crude oil.

In addition to used motor oil, hydraulic oils used in most agricultural and industrial machinery can be cleaned up and used again. In some cases, commercial filtration units may be used to filter hydraulic oils for reuse. Some businesses re-refine used oil for reuse or process used oil into a saleable fuel.

2. **Burning for Energy Recovery.** The U.S. EPA considers the burning of waste oil to be a form of recycling, because burning the oil recovers the heat value of the oil. A special waste oil burner must be used to burn used oil. The burner must be under 500,000 Btu per hour capacity. A person can only burn 1) his or her own oil, 2) used oil received from other households, and 3) used oil which is received from a registered used oil marketer and which has been demonstrated to meet certain quality specifications (i.e., it is not a listed hazardous waste).

3. **Product Manufacturing.** Used oil has been used in products—most notably in roofing shingles and asphalt. In recent years, oil filtration units have been developed that filter and blend used diesel crankcase oil for supplementing diesel fuel.

Getting Rid of Your Used Oil

The 1991 Montana legislature passed a bill requiring all stores that sell oil to post a sign with the address of the nearest used oil recycling center within 25 miles. When shopping, look for this sign:



For stores not posting the sign, and for communities without convenient used oil drop-off centers, contact the Montana Department of Health and Environmental Sciences—Solid Waste Program at 444-1430, or the Montana Recycling Hotline at 1-800-823-MEIC, to find the nearest used oil location. Also, check with local service station repair garages or city or county maintenance shops for collection services.

Keep these important points in mind when recycling used motor oil:

- You can recycle used oil from cars, boats, motorcycles and even lawn mowers.
- Synthetic oils can be recycled with the usual motor oil.
- Use a dirt-free drain pan that can hold as many quarts as your car's crankcase and that has NOT been used for paint, cleaning solvents, antifreeze or anything besides motor oil.
- Do not mix oil with other things. Just a small amount of something else can cause the contents of an entire 200-gallon collection tank to be classified as a hazardous waste that has to be delivered to a special hazardous waste recycling or disposal facility. Use of such facilities is expensive. Do not add antifreeze, solvents or anything else to oil bound for recycling.
- Take the used oil to a used oil collection site. Such sites are likely to be at service stations, automotive parts stores, quick oil change businesses, motor oil retailers, or city or county vehicle maintenance shops. Look for a sign that says "Recycle Used Oil."
- If you don't change your own oil, make sure that the garage or service station you take your car to DOES recycle used oil.
- To recycle your used oil container, put the lid back on and save it for your next oil change. Store it away from children and pets.

What's the Best Way to Change My Oil?

1. Start with a car that's been running for awhile. Old oil will drain out more quickly if it's hot.
2. Before getting under the car, make sure the parking brake is on, and block the wheels.
3. Remove the drain plug on the bottom of the oil pan, and allow the oil to drain out into a drain pan.
4. If you change your oil filter, loosen the old oil filter with a wrench, remove it and drain by punching a hole in the top and inverting it over your drain pan. Dispose of the old filter by putting some paper towels over the hole. Then put the old filter and paper towels in the box the new filter came in. Place the box in the trash.
5. Lubricate the rubber seal on the new filter with oil, then spin it on. Tighten it snugly with your fingers—do not use a wrench to tighten it. Replace the drain plug, making sure it's tight.
6. Add the new oil (check your owner's manual for the right amount).
7. Start the car. The oil pressure warning light will go out after a few seconds. Let the engine run for a few minutes.
8. Turn the car off, and check the oil level. Also check around the filter and drain plug for any leakage.
9. Record the car mileage, the date of the oil change,

and the weight and brand of oil on a doorjamb sticker or in a record book.

10. Pour your used oil from the drain pan into a container with a leak-proof lid—a rinsed-out plastic milk jug, for instance. Use a funnel to avoid spills.

11. Take the used oil to a collection center.

Recycling Automobile Batteries

Facts:

- Wet cell batteries, the type used in automobiles, boats and other vehicles, are hazardous because they contain highly-corrosive sulfuric acid, lead and other toxic metals. Avoid skin contact and inhalation of fumes.
 - A standard automobile battery contains almost 18 pounds of lead and one gallon of lead-contaminated sulfuric acid.
 - Improperly disposed of lead-acid batteries are likely to pollute the air, soil and/or water. When burned, batteries containing lead and sulfuric acid pollute the air. When thrown into a ditch or dumped in a landfill, batteries can crack and deteriorate, leaking lead-contaminated sulfuric acid into the soil. Hazardous waste can leach into surface water and groundwater, polluting lakes, streams and drinking water supplies.
 - Car batteries contribute two-thirds of all the lead in municipal waste. Lead is poisonous and can cause liver, kidney and brain damage.
 - Dumping batteries is not only a threat to the environment, it's a waste of lead, a valuable metal.
 - Studies show that about 8.5 million, or up to 10 percent of all lead-acid batteries bought in the U.S. are not recycled.
 - Batteries can be recycled and used to make new batteries, cable coverings, light bulbs, electronic equipment, radiation shielding and other useful products.
 - Some of the sulfuric acid in batteries can be reused in new batteries or in fertilizer. Most of it is neutralized for safe disposal.
 - Battery casings are recycled into new casings, waste baskets, and other plastic products.
 - Used batteries are easily recycled. Contact local recycling centers, auto parts stores, gas stations, or a local landfill and ask if they accept batteries for recycling. If you are purchasing a new car battery, ask if the retailer will take your old battery in trade and recycle it.
- #### Handling Your Battery
- If you remove the battery from your car, boat, tractor or other vehicle yourself, be careful. Lead-acid batteries contain explosive hydrogen in addition to sulfuric acid.
- To avoid explosions and acid burns, keep open flames away from the battery and don't smoke near it.
 - Wear safety glasses or goggles when working with batteries.

- Take care when using metal tools. You might accidentally make a direct connection and create a dangerous spark.

- If you drop a battery, use baking soda or lime to neutralize any spilled acid. Use gloves and avoid acid contact with skin, eyes and clothing.

- When taking a battery to a retailer, keep it right-side-up and carry it in a wooden box or leak-proof container.

- If you don't plan to deliver the battery right away, place it somewhere safe, away from children and pets.

- Don't store batteries outside in frigid weather. Frozen batteries can crack and leak sulfuric acid.

Antifreeze and Transmission Fluid

Facts:

- Antifreeze is made of a petroleum product called ethylene glycol. This product is hazardous to the environment and to water supplies in particular.

- You can recycle antifreeze by having it redistilled. Whether you change your own antifreeze or a service station does, make sure it is recycled. You may have to pay a fee, but the price is well worth it.

- Transmission fluid contains lead and other toxic heavy metals. Take used transmission fluid to a service station or reclamation center for recycling.

- With both antifreeze and transmission fluid, make sure you transport it in a labeled, clean container with a tight fitting lid.

Dealing With Used Tires

The United States scraps 234 million tires each year, 82 percent through stockpile, landfills and illegal dumps. The remaining tires are incinerated and recycled.

When landfilling or stockpiling, tires can create environmental problems. Most of the health and environmental hazards related to tire disposal are caused by long-standing stockpiles of whole tires. The air pockets in tires provide convenient habitats for rodents. The pockets also hold water, thereby providing ideal breeding grounds for mosquitoes, which can transmit serious diseases.

Stockpiled tires also pose fire hazards. Burning stockpiles are difficult to extinguish because the air pockets in the tires constantly feeds the flames. When burning, tires emit a noxious, air-polluting black smoke. The remaining

oils and soot can run off into and contaminate surface water and ground-water supplies.

In 1989, over 13 percent of the tires discarded in the U.S. were recycled into new products, converted into energy, or reused for applications other than vehicle transportation. Over four percent were exported. (Retreads and old tires used directly for other vehicles are not considered to be scrap tires.)

What can be done with used tires:

Rubberized Asphalt. Studies indicate that roads constructed using an asphalt/rubber mixture last longer, are significantly more skid-resistant, offer reduced noise levels and light reflectivity, and are less prone to abrasion. Over 15,000 tires can be recycled in just one mile of two-lane highway using a 3-inch layer of the asphalt/rubber mixture. Estimates show that if only one percent of the roads being rehabilitated in the U.S. were done using rubberized asphalt, over 20 percent of the scrap tires produced that year could be used.

Incineration as a Fuel. Each tire has energy potential. Therefore, another promising but highly debated approach is incineration. Tires are being incinerated as a fuel to produce steam and gases to spin electrical turbines. Tires are also becoming popular as a fuel for industrial boilers.

Consumer Goods. Although making up only two percent of tire recycling, many consumer products are being made from used tires. Products that manufacturers have created from recycled rubber include mats, hoses, timber-like posts, home flooring tiles, roll-out for gymnasts, mesh for hillside erosion control, mulch, vehicle mud flaps and bumpers, pickup bed liners, and marine equipment.

If tire recycling is available in your area, take your used tires to be recycled. If you are purchasing tires, see if the dealer can have your old tires recycled.

Acknowledgements

Thanks to the following groups for providing input and reviewing this MontGuide:

- Montana Department of Health and Environmental Sciences—Solid and Hazardous Waste Program

- Montana Environmental Information Center

- Keep Montana Clean and Beautiful

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES



STAN STEPHENS, GOVERNOR

FAX #(406) 444-1499

STATE OF MONTANA

OFFICE 836 Front Street
LOCATION: Helena, Montana

MAILING Cogswell Building
ADDRESS: Helena, MT 59620

SUMMARY OF REQUIREMENTS FOR CONDITIONALLY EXEMPT
SMALL QUANTITY GENERATORS

Small quantity generators whose generation rate is always less than 220 pounds of hazardous waste within any month are conditionally exempt from the hazardous waste provisions of RCRA.

In order to maintain their conditionally-exempt status, small quantity generators must:

1. Identify all hazardous wastes generated.
2. Limit the amount of waste generated per month to less than 220 pounds.
3. Limit the total amount of waste accumulated on-site at any one time to less than 2,200 pounds.
4. Limit the amount of acutely hazardous waste generated to 2.2 pounds per month (or 220 pounds of soil contaminated from an acutely hazardous waste spill).
5. Limit the total amount of acutely hazardous waste accumulated on-site at any one time to 2.2 pounds (or 220 pounds of soil contaminated from an acutely hazardous waste spill).
6. Dispose of hazardous wastes at:
 - * A legitimate recycling facility
 - * A permitted Hazardous Waste Treatment, Storage, or Disposal Facility (contact this office for a list of facilities known to offer services in the vicinity of Montana)
 - * A licensed Class II sanitary landfill (only if the waste is in a solid state and the owner/operator of the landfill agrees to accept the waste).

For further information contact:

Montana Department of Health and Environmental Sciences
Solid and Hazardous Waste Bureau
Cogswell Building
Helena, MT 59620
Telephone: (406) 444-1430

APPENDIX C
APPLICATION FOR HHW COLLECTION PROGRAM

APPLICATION FOR REGISTRATION HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM

A. General Information

1. Applicant: _____

Address: _____ Phone Number: _____

2. Program Coordinator: _____

Address: _____ Phone Number: _____

3. Hazardous Waste Consultant: _____

Address: _____ Phone Number: _____

4. Hazardous Waste Disposal/Recycling Site(s): _____

Address: _____ Phone Number: _____

Address: _____ Phone Number: _____

5. Hazardous Waste Transporter: _____

Address: _____ Phone Number: _____

6. Is an EPA Identification Number Required by Hazardous Waste Disposal/Recycling Facility? Yes _____ No _____
If so, what are their names and identification number?

Name: _____ Identification Number: _____

Name: _____ Identification Number: _____

7. Site plans included with application? Yes _____ No _____

They should delineate the location of the collection, processing, and storage areas for HHW.

8. Floor plans and details for the collection, processing, and storage areas included in the application? Yes _____ No _____

The collection area should be designed to contain spills and leaks, secured to control access, meet all applicable National Fire Protection Association codes, and, if applicable, covered to exclude rain water.

9. Operational plan included with application? Yes _____ No _____

a) Please fill in the following chart addressing the expected sources, types, and anticipated quantities of HHW to be collected.

SOURCES	WASTE TYPE	QUANTITY

b) Please describe the proposed treatment, final disposal, or recycling procedures to be utilized and the location(s) of where each step will occur. _____

c) What control methods would be used to deter unwanted waste and waste generators from the collection program? _____

d) Please attach a copy of the negotiated contract between the program coordinator and the proposed hazardous waste consultant.

e) What is the proposed accumulation time and method of storage? _____

f) Will a personnel training program be utilized for the collection workers? Yes _____ No _____

What type of program? _____

g) What is your budget for this program? _____

7. Describe briefly the public education program to be utilized for the event(s). _____

8. Please attach the following information for our records:

a) A contingency plan and the possible emergency procedures to be followed at the event.

b) A maintenance plan for the event.

c) The general provisions for ignitable, reactive, and incompatible wastes.

d) All other pertinent information.

B. Certification

This is to certify that I have personally examined and am familiar with the information in this application and any attached documents. I have also read the *Household Hazardous Waste Management in Montana* document produced by the Montana Department of Health and Environmental Sciences. To the best of my knowledge, information, and belief, the submitted information is accurate and complete.

Applicant's Signature

Date

APPENDIX D

CONSULTING FIRMS QUALIFICATION MATRIX

SERVICES PROVIDED										TOTAL STAFF										OTHER INFORMATION									
Geologic	Hydrologic	Civil Engineering	Environmental Eng.	Emergency Response	Hazardous Waste	UST Removal	Petro Claim Compl.	Engineer/Hydrologist	Senior Engineer	Senior Hydrologist	Industrial Hygienist	Project Scientist	Field Technician	Office/Drafting Tech	Data/Word Processor	Secretarial	Accountant	Drill Crew	Organic Laboratory	Drill Rig	Monitoring Well Lic.	UST Remover Lic.	Liability Coverage/ Bonded Amount						
►BILLINGS◄																													
Braun Int. (406) 256-0330								17	2	3	3		2	1/2	1/2	1	1	1	3					\$6M na					
Chen-Northern (406) 248-9161								27	4	4		2	5	5		2	2	1	2					\$10M na					
Envirocon (406) 652-6337								13						10		1	1	1						\$7M \$15M					
GeoResearch (406) 248-6771								28	4		1	10	3	2	4	2	2							\$1M \$100K					
HKM (406) 656-6399								57	4	17	3			13	12	4 1/2	2 1/2	1						\$1M 0					
Hydrometrics (406) 656-1172								4	2	1							1							\$2M na					
Morrison-Mai. (406) 656-6000								36		7	1		3	4	16	2	1							\$2M \$10K					
Olympus Env. (406) 245-3554								4	1				1	1	1/2		1/2							\$2M \$2M					
Spectrum Eng. (406) 259-2412								8	1	3	1			1	1	1/2	1/2							\$1M \$10K					
Unifield Eng. (406) 245-4455								22	5	3	1		1	1	7	3	1/2	1/2						\$1M \$4K					
Warchola (406) 656-3427								1					1	1	1	1								na \$5K					
►BOZEMAN◄																													
Gaston Eng. (406) 586-0588								18	2	2	1			3	4	1	1	1	3					na na					
Matney-Frantz (406) 586-3748								12	3	2	1		1	2	1		1	1						\$1M na					
Morrison-Mai. (406) 587-0721								17		9				3	4	1	1							\$2M \$10K					
Schafer & Ass. (406) 587-3478								20	4	1	1		7	3	1	2	1							\$2M na					
►BUTTE◄																													
ES & E (406) 782-0900								13	3	1	4		1	1	1	1	1							\$5M \$20M					
MSE 1-800-441-8213								105	4	15	2	6	10	7	12	10	29	10						na na					
PTI (406) 723-6519								8	2				4	1			1							\$5M \$70K					
SRM (406) 782-4201								38	8	7	2	1	3	9	1	1	4	2						\$5M \$10M					

Braun Intertec
PO Box 80190
Billings, MT 59108-0190
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Fax: (406) 256-2318

Chen-Northern, Inc.
600 S 25th Street
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Phone: (406) 248-9161
Fax: (406) 248-9282

Envirocon, Inc.
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Billings, MT 59108-0107
Phone: (406) 652-6337
Fax: (406) 652-1724

GeoResearch, Inc.
115 North Broadway
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HKM Associates
2727 Central Avenue
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Hydrometrics, Inc.
5825 Lazy Lane
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105 West Main, Suite A
Bozeman, MT 59715
Phone: (406) 586-3748
Fax: (406) 586-8437

Morrison-Maierle, Inc.
901 Technology Blvd
Bozeman, MT 59715
Phone: (406) 587-0721
Fax: (406) 587-1176

Schafer & Associates
865 Technology Blvd
Box 6186
Bozeman, MT 59715
Phone: (406) 587-3478
Fax: (406) 597-0331

Environmental Science
& Engineering, Inc.
66 W Park, Suite 210
Butte, MT 59701
Phone: (406) 782-0900
Fax: (406) 782-2654

MSE, Inc.
PO Box 4078
Butte, MT 59701
Phone: 1-800-441-8213
Fax: (406) 723-8328

PTI Environmental Services
8 West Park Street, Suite 310
Butte, MT 59701
Phone: (406) 723-6519
Fax: (406) 723-6510

Special Resource Mgmt, Inc.
I-90 & Rocker Interchange
PO Box 4168
Butte, MT 59702
Phone: (406) 782-4201
Fax: (406) 782-9968

SERVICES PROVIDED	Geologic	Hydrologic	Civil Engineering	Environmental Eng.	Emergency Response	Hazardous Waste	UST Removal	Petro Claim Compl.	TOTAL STAFF	Engineer/Hydrologist	Senior Engineer	Senior Hydrologist	Industrial Hygienist	Project Scientist	Field Technician	Office/Drafting Tech	Data/Word Processor	Secretarial	Accountant	Drill Crew	OTHER INFORMATION	Organic Laboratory	Drill Rig	Monitoring Well Lic.	UST Remover Lic.	Liability Coverage/Bonded Amount
►GREAT FALLS◄																										
Chen-Northern (406) 453-1641	■	■	■	■	■	■	■	■	7	1	1				1		1	1		2		■	■	■	\$10M na	
Delta Eng. (406) 727-3687	■	■	■	■	■	■	■	■	15	4	4	1			4	1	1/2	1/2				■	■		\$1M \$5K	
Morrison-Mai. (406) 454-1513	■	■	■	■	■	■	■	■	3		2							1				■			\$2M \$10K	
Neil (406) 453-5478		■	■	■	■	■	■	■	19	1	5				6	5	1/2	1	1/2						\$1M na	
NTL Eng. (406) 453-5400	■	■	■	■	■	■	■	■	9		3				4			1	1			■	■		\$1M \$4K	
►HELENA◄																										
Bison Eng. (406) 442-5768	■	■	■	■	■	■	■	■	19	1	3	1	2	2	3	1 1/2	1 1/2	2	2						na na	
CD&M, Inc. (406) 442-9565	■	■	■	■	■	■	■	■	9	4	1			2			1	1							\$2M na	
Chen-Northern (406) 443-5210	■	■	■	■	■	■	■	■	31	6	3	7		2	3	3	2	1	2	2		■	■	■	\$10M na	
Damschen (406) 449-8627	■	■	■	■	■	■	■	■	10	1	3				2	3	1/2	1/2	1			■			na na	
ERM (406) 442-2285	■	■	■	■	■	■	■	■	4	1 1/2	1 1/2						1/2	1/2				■			\$1M na	
Hydrometrics (406) 443-4150	■	■	■	■	■	■	■	■	89	10	6	4	1	5	36	8	9	6	4			■	■	■	\$2M na	
L.C. Hanson (406) 442-8108	■	■	■	■	■	■	■	■	8	1	3				1	1	1/2	1/2	1						\$2M na	
Morrison-Mai. (406) 442-3050	■	■	■	■	■	■	■	■	55	3	17			2	4	10	2	10	3			■			\$2M \$10K	
Olympus Env. (406) 443-3087	■	■	■	■	■	■	■	■	10	1		2		1	4	1		1				■	■		\$2M \$2M	
PRC (406) 442-5588	■	■	■	■	■	■	■	■	16	10	1	2				1	1	1				■	■		\$3M \$25K	
Tetra Tech (406) 449-3440	■	■	■	■	■	■	■	■	3	1		1/2		1/2			1/2	1/2				■			\$4M \$1M	
►KALISPELL◄																										
Hydrometrics (406) 756-0198	■	■	■	■	■	■	■	■	2					2								■	■	■	\$2M na	
Morrison-Mai. (406) 752-2216	■	■	■	■	■	■	■	■	7		4						1					■			\$2M \$10K	
Neil (406) 752-5478		■	■	■	■	■	■	■	4		1				1	1	1/2	1/2							\$1M na	
Spratt & Ass. (406) 752-3516	■	■			■	■			3	1		1			1/2				1/2			■	■		\$500K \$4k	

Chen-Northern, Inc.
528 Smelter Avenue
PO Box 949
Great Falls, MT 59403
Phone: (406) 453-1641
Fax: (406) 727-2070

Delta Engineering P.C.
2701 16th Avenue NE
PO Box 1481
Great Falls, MT 59403
Phone: (406) 727-3687
Fax: (406) 727-9878

Morrison-Maierle, Inc.
1321 8th Ave N, Suite 104
Great Falls, MT 59401
Phone: (406) 454-1513
Fax: (406) 454-1656

Neil Consultants, Inc.
4509 North Star Blvd
PO Box 6350
Great Falls, MT 59406
Phone: (406) 453-5478
Fax: (406) 453-2009

NTL Engineering & GeoScience, Inc.
1505 14th Street SW
PO Box 3269
Great Falls, MT 59403-3269
Phone: (406) 453-5400
Fax: (406) 761-6655

Bison Engineering Inc.
30 South Ewing
PO Box 1703
Helena, MT 59624
Phone: (406) 442-5768
Fax: (406) 449-6653

Camp Dresser & McKee Inc.
7 W 6th Ave, Suite 604
Helena, MT 59601
Phone: (406) 442-9565
Fax: (406) 449-3668

Chen-Northern, Inc.
1610 B Street
PO Box 4699
Helena, MT 59604
Phone: (406) 443-5210
Fax: (406) 449-3729

Damschen & Associates
PO Box 4817
Helena, MT 59604
Phone: (406) 449-8627

ERM - Rocky Mtn., Inc.
7 W 6th Ave, Suite 5c
Helena, MT 59601
Phone: (406) 442-2285
Fax: (406) 442-4691

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601
Phone: (406) 443-4150
Fax: (406) 443-4155

L.C. Hanson Company
2969 Airport Road #1A
Helena, MT 59601
Phone: (406) 442-8108
Fax: (406) 443-5628

Morrison-Maierle, Inc.
910 Helena Avenue
Helena, MT 59601
Phone: (406) 442-3050
Fax: (406) 442-7862

Olympus Environmental, Inc.
765 Colleen
Helena, MT 59601
Phone: (406) 443-3087
Fax: (406) 443-0232

PRC Environmental Mgmt. Inc.
Power Block Bldg, Suite 612
Helena, MT 59601
Phone: (406) 442-5588
Fax: (406) 442-7182

Tetra Tech Inc.
2969 Airport Road
Helena, MT 59601
Phone: (406) 449-3440
Fax: (406) 449-3445

Hydrometrics, Inc.
2nd West Centre
22 2nd Ave W, Suite 1100
Kalispell, MT 59901
Phone: (406) 756-0198
Fax: (406) 755-5990

Morrison-Maierle, Inc.
221 Parkway Drive
PO Box 8057
Kalispell, MT 59904-8057
Phone: (406) 752-2216
Fax: (406) 752-2391

Neil Consultants, Inc.
1131 S Main Street, Suite #6
Kalispell, MT 59901
Phone: (406) 752-5478
Fax: (406) 257-4323

Spratt & Associates
22 Second Avenue West
Suite 1500/2nd West Centre
PO Box 1579
Kalispell, MT 59903
Phone: (406) 752-3516
Fax: (406) 257-4125

SERVICES PROVIDED										TOTAL STAFF	Engineer/Hydrologist	Senior Engineer	Senior Hydrologist	Industrial Hygienist	Project Scientist	Field Technician	Office/Drafting Tech	Data/Word Processor	Secretarial	Accountant	Drill Crew	OTHER INFORMATION			
Geologic	Hydrologic	Civil Engineering	Environmental Eng.	Emergency Response	Hazardous Waste	UST Removal	Petro Claim Compl.	Organic Laboratory	Drill Rig													Monitoring Well Lic.	UST Remover Lic.	Liability Coverage/ Bonded Amount	
►LEWISTOWN◄																									
Abenaki Geo. (406) 538-5800	■	■	■	■		■	■	13	2	3	2				2			1	1	2		■	■	\$1M 0	
►LIVINGSTON◄																									
Envirocon (406) 222-2832	■	■		■	■	■	■	6	1		1				3		1						■	■	\$7M \$15M
Hallett (406) 222-1446	■	■		■		■	■	6	½					½	½	½	½	½	1	2		■	■	■	\$1K \$1.25M
►MILES CITY◄																									
Matney-Frantz (406) 232-0055	■	■	■	■		■	■	3	2					1									■		\$1M na
►MISSOULA◄																									
Chen-Northern (406) 543-3045	■	■				■	■	3	2		1												■	■	\$10M na
Envirocon (406) 523-1150	■	■		■	■	■	■	42	4	2	1	3	3	23	½	1	3	2				■	■		\$7M \$15M
Land & Water (406) 721-0354	■	■	■	■	■	■	■	11	½	½	2		1	4	1		1	1				■			\$1M na
MSC (406) 728-7755	■	■		■		■	■	10	1½		1	1	2	1	½		2	1				■			\$1M \$0
Shannon Env. (406) 543-4210	■	■	■	■	■	■	■	17	2	1	2		3	5	½	½	½	½	2			■	■	■	\$2M \$100K

Abenaki GeoEnvironmental, Inc.
PO Box 1018
Lewistown, MT 59457
Phone: (406) 538-5800
Fax: (406) 538-5800

Envirocon, Inc.
PO Box 1154
Livingston, MT 59047
Phone: (406) 222-2832
Fax: (406) 222-8792

Hallett Reclamation Company
PO Box 169
Livingston, MT 59047
Phone: (406) 222-1446
Fax: (406) 222-6271

Matney-Frantz Engineering, P.C.
1707 Main Street
PO Box 537
Miles City, MT 59301
Phone: (406) 232-0055

Chen-Northern, Inc.
PO Box 2730
Missoula, MT 59806
Phone: (406) 543-3045

Envirocon, Inc.
101 International Way
PO Box 8243
Missoula, MT 59807
Phone: (406) 523-1150
Fax: (406) 523-1182

Land & Water Consulting
1120 Cedar
PO Box 8254
Missoula, MT 59802
Phone: (406) 721-0354
Fax: (406) 721-0355

MCS Environmental
2104 Reserve Street
Missoula, MT 59801
Phone: (406) 728-7755
Fax: (406) 728-7367

Shannon Environmental Services
1151 West Broadway
Missoula, MT 59802
Phone: (406) 543-4210
Fax: (406) 543-4220

	SERVICES PROVIDED	Geologic	Hydrologic	Civil Engineering	Environmental Eng.	Emergency Response	Hazardous Waste	UST Removal	Petro Claim Compl.	TOTAL STAFF	Engineer/Hydrologist	Senior Engineer	Senior Hydrologist	Industrial Hygienist	Project Scientist	Field Technician	Office/Drafting Tech	Data/Word Processor	Secretarial	Accountant	Drill Crew	OTHER INFORMATION	Organic Laboratory	Drill Rig	Monitoring Well Lic.	UST Remover Lic.	Liability Coverage/ Bonded Amount
►BOULDER, CO◄																											
PTI (303) 444-7270		■	■		■	■	■	■		17	2				9	2		1	3						■	■	\$5M \$70K
►COUR d'ALENE, ID																											
Grant, Schr. (208) 667-8602		■	■	■	■	■	■	■		9	1	3	1			1	1	1	1							■	\$1M 0
►BISMARK, ND◄																											
Braun (701) 255-7180		■	■	■	■			■		24	3	2	1	3	1	3	4	1	1	1	1	4		■	■	■	\$5M na
►LAKE OSWEGO, OR◄																											
PTI (206) 643-9803		■	■		■	■	■	■		21	3				9	4		1	4						■	■	\$5M \$70K
►LOGAN, UT◄																											
Bio/West (801) 752-4202		■	■		■		■	■	■	24	2	1	2		2	4	6	4	1	2					■	\$1M na	
►SALT LAKE CITY, UT◄																											
Crawford Env. 1-800-843-6835		■	■	■	■		■			15	6	1	6						1	1						\$1M na	
►BELLEVUE, WA◄																											
PTI (206) 643-9803		■	■		■	■	■	■		74	2		1		30	4	4	8	18	7				■	■	\$5M \$70K	
►SPOKANE, WA◄																											
Hydrometrics (509) 536-1904		■	■	■	■		■	■	■	3					2	1								■	■	■	\$2M na
Roar Tech 1-800-428-0214		■	■	■	■	■	■	■		28	1	1	1		1	15	2	4	2	1					■	\$1M \$1M	
►TACOMA, WA◄																											
Hydrometrics (206) 572-5481		■	■	■	■	■	■	■		21	1	2	1	1	2	10	2	1	1					■	■	■	\$2M na

Out-of-State

PTI Environmental Services
2995 Baseline Road, Suite 202
Boulder, CO 80303
Phone: (303) 444-7270
Fax: (303) 444-7528

Grant, Schreiber & Associates
2005 Ironwood Parkway
Coeur d'Alene, ID 83814
Phone: (208) 667-8602
Fax: (208) 667-2426

Summit Envirosolutions
10201 Wayzata Blvd, Suite 100
Minneapolis, MN 55305
Phone: (612) 595-8888
Fax: (612) 595-0888

Braun Intertec Corporation
913 South 18th Street
PO Box 2379
Bismarck, ND 58502-2379
Phone: (701) 255-7180
Fax: (701) 255-7208

PTI Environmental Services
5000 Kruse Way Place
Building 2, Suite 285
Lake Oswego, OR 97035
Phone: (206) 643-9803
Fax: (206) 643-9827

Bio/West, Inc.
1063 West 1400 North
Logan, UT 84321
Phone: (801) 752-4202
Fax: (801) 752-0507

Crawford Environmental
Specialists
361 W Ironwood Drive
Salt Lake City, Utah 84115
Phone: (801) 485-8400
Fax: (801) 485-7208

PTI Environmental Services
15375 SE 30th Place, Suite 250
Bellevue, WA 98007
Phone: (206) 643-9803
Fax: (206) 643-9827

Hydrometrics, Inc.
104 S Freya, Suite 211A
Spokane, WA 99202
Phone: (509) 536-9246
Fax: (509) 536-1904

Hydrometrics, Inc.
Sea First Center
950 Pacific, Suite 610
Tacoma, WA 98402
Phone: (206) 572-5481
Fax: (206) 572-5487

APPENDIX E

HAZARDOUS WASTE SITE INVESTIGATION/REMEDIATION FIRMS

HAZARDOUS WASTE SITE INVESTIGATION/REMEDIATION FIRMS

Burlington Environmental
Waterfront Place One
1011 Western Avenue
Suite 700
Seattle, WA 98104
(206) 654-8125

Cableway, Inc.
Star Route, Box 9
Spangle, WA 99031
(509) 448-8364

Chem-Safe Services, Inc.
P.O. Box 616
Kittitas, WA 98934
(509) 968-3973

Chem-Security Systems, Inc.
Box 96, Route 1
Arlington, OR 97812
(503) 454-2643

Chen-Northern Inc.
P.O. Box 30615
Billings, MT 59107
(406) 248-4233

Chen-Northern Inc.
1610 B Avenue
Helena, MT 59601
(406) 443-5210

Choctaw Abatement Services
9300 West 110th Street, Suite 440
Overland Park, KS 66210
(913) 338-2802

Clayton Environmental Consultants
22345 Roethel Drive
Novi, MI 48375
(313) 344-1770

Crosby and Overton Inc.
P.O. Box 1085
Kent, WA 98035
(206) 872-8030

ENSCO
5111 N. Scottsdale Road
Scottsdale, AZ 85250
(602) 947-8000

ERM - Rocky Mountain
5950 South Willow Drive Suite 310
Englewood, CO 80111
(303) 741-5050

Envirocon, Inc.
101 International Way
P.O. Box 8243
Missoula, MT 59807
Attn: Bryan Douglass
(406) 523-1150

Land and Water Consulting, Inc.
P.O. Box 8254
Missoula, MT 59807
Attn: Janet O'Hara
(406) 721-0354

Law Environmental, Inc.
1011 East Touhy, Suite 395
Des Plaines, Illinois 60018
(708) 699-5084

Disclaimer: This list provides directory information on commercial firms that offer hazardous waste services. The Montana Department of Health and Environmental Sciences does not necessarily endorse any listed companies, and a company's absence from this list does not imply prejudice or impropriety. We recommend that a prospective customer contact a number of companies to obtain the best service and price. Listed companies reserve the right to evaluate the extent of their services on a case by case basis. This list is subject to change without notice. State laws prohibit the use of this directory as a mailing list.

Matney Frantz Engineering
105 West Main, Suite A
Bozeman, MT 59715
(406) 586-3748/FAX (406)586-8437

Matney Frantz Engineering
P.O. Box 537
Miles City, MT 59301
(406) 232-0055

MSE, Inc.
220 North Alaska Street
Butte, MT 59702
(406) 723-8213

Northwest Environmental Service, Inc.
P.O. Box 22238
Billings, MT 59104
(406) 245-7383

J.B. O'Hara
Hazardous Waste Consulting
400 Ben Hogan Drive
Missoula, MT 59803
(406) 542-3145

Olympus Environmental
765 Colleen Street
Helena, MT 59601
(406) 443-3087

Pacific Treatment
P.O. Box 50445
Billings, MT 59105
(406) 259-5918

Parametrix, Inc.
5700 Kitsap Way, Suite 202
Bremerton, WA 98312-2234
(206) 337-0014/383-1835

Pioneer Technical Services
P.O. Box 3445
Butte, MT 59702
(406) 494-4024

Reidel Environmental Services, Inc.
5850 East 58th Ave., Suite F
Commerce City, CO 80022
(303) 288-8702

Reidel Environmental Service, Inc.
P.O. Box 3096
Portland, OR 97203
(503) 286-4656 or 800-334-0004

Rollins Environmental Services
P.O. Box 609
Deer Park, TX 77536
(713) 479-6001

SRH Environmental Management
102 East Main
Missoula, MT 59802
(406) 543-4210

Safety-Kleen Corporation
1537 1/2 First Avenue South
Fargo, ND 58103
Attn: Scott Wenger
1-800-669-6291 or (701) 237-9070

Safety-Kleen Corporation
E. 9516 Montgomery, Unit 19
Spokane, WA 99206
Attn: Wade Hardan
1-800-669-5902 or (509) 928-8353

Special Resource Management, Inc.
Corporate Office
Rocker Interchange, P.O. Box 4168
Butte, MT 59702
(406) 782-4201 or 800-334-8911

Disclaimer: This list provides directory information on commercial firms that offer hazardous waste services. The Montana Department of Health and Environmental Sciences does not necessarily endorse any listed companies, and a company's absence from this list does not imply prejudice or impropriety. We recommend that a prospective customer contact a number of companies to obtain the best service and price. Listed companies reserve the right to evaluate the extent of their services on a case by case basis. This list is subject to change without notice. State laws prohibits the use of this directory as a mailing list.

U.S. Pollution Control, Inc.
5662 South 300 West
Murray, UT 84107
(405) 528-8371

Waste Management, Inc.
3003 Butterfield Road
Oak Brook, IL 60521
(312) 572-8800

Waste Recovery Services, Inc.
995 Highway 10 East
P.O. Box 910
Belfield, ND 58622
(701) 575-8520 Fax (701) 575-8109

Disclaimer: This list provides directory information on commercial firms that offer hazardous waste services. The Montana Department of Health and Environmental Sciences does not necessarily endorse any listed companies, and a company's absence from this list does not imply prejudice or impropriety. We recommend that a prospective customer contact a number of companies to obtain the best service and price. Listed companies reserve the right to evaluate the extent of their services on a case by case basis. This list is subject to change without notice. State laws prohibit the use of this directory as a mailing list.

APPENDIX F
HAZARDOUS WASTE DISPOSAL FACILITIES

HAZARDOUS WASTE DISPOSAL FACILITIES

Sept. 23, 1992

IDAHO

Envirosafe Services of Idaho (ESI)
P.O. Box 417
Boise, ID 83701
Joseph McNeal (208) 384-1500
Janet Kronwall (303) 449-4619

ILLINOIS

Law Environmental, Inc.
1011 East Touhy Ave, Suite 395
Des Plaines, Illinois 60018
Kenneth E. Erickson (708) 699-5084

LOUISIANA

CECOS International
P.O. Box 1849
Sulphur, LA 70664
Austin Arlie (318) 527-6857

NEVADA

U.S. Ecology
P.O. Box 578
Beatty, NV 89003
Tom Hayes (702) 553-2203

NORTH DAKOTA

Waste Recovery Services, Inc.
995 Highway 10 East
P.O. Box 910
Belfield, ND 58622
(701) 575-8520 Fax (701) 575-8109

OREGON

Chemical Waste Management
Star Route, Box 9
Arlington, OR 97812
Richard Zweigh (503) 454-2643

TEXAS

Odessa Injection Systems
2407 East Murphy
Odessa, TX 79761
Dan Spencer (915) 333-2826

USPCI

515 W. Greens Road
Suite 500
Houston, TX 77067
Lindley Bennett 800-877-2416

UTAH

USPCI

Grassy Mountain Facility
P.O. Box 22750
Salt Lake City, UT 84122-9998
Chuck Lawrence (801) 595-3900

Disclaimer: This list provides directory information on commercial firms that offer hazardous waste services. The Montana Department of Health & Environmental Sciences does not necessarily endorse any listed companies, and a company's absences from this list does not imply prejudice or impropriety. We recommend that a prospective customer contact a number of companies to obtain the best service and price. Listed companies reserve the right to evaluate the extent of their services on a case by case basis. This list is subject to change without notice. State laws prohibits the use of this directory as a mailing list.

APPENDIX G
HAZARDOUS WASTE TRANSPORTERS

HAZARDOUS WASTE TRANSPORTERS

September 20, 1993

CANADA

Fandricks Transport

RR #1 LeDuc

Alberta, Canada T9E2X1

John Durnford (403)985-2197

Lyle Grover, Inc.

P.O. Box 1387

Lethbridge, Alberta, Canada T1J 4K1

L. Grover (403) 320-8810

C. Steen Trucking LTD

11221 87 Avenue

Fort Saskatchewan,

Alberta Canada T8L 2S3

Ron Ward (403) 998-1014

Northern Industrial Carriers Ltd.

7823 34th Street

Edmonton, Alberta T6B2V5

Joesph Antolick (403) 465-0341

IDAHO

SI-McStay Corporation

2277 North Longview Place

Boise, ID 83702

Steve Inouve (208) 343-9742

MONTANA

Big Sky Industrial

1524 Lockwood Road

Billings, MT 59101

Tim Palmer (406) 256-4949

Bitterroot International Systems, Ltd.

500 Taylor Street

Missoula, MT 59802

Tom Kose (406) 721-6320

Chemical Waste Management Inc.

1404 Gold Avenue, Suite 1

Bozeman, MT 59715

W. John Tietz (406) 587-6140

Frontier Transportation, Inc.

2422 Hwy 2 West

Kalispell, MT 59901

Romona Doty (406) 755-6900

Great Western Chemical Co.

2000 Boulder Avenue

Helena, MT 59601

Greg Peterson (406) 442-8900

JGL Distributing, Inc.

1002 East Broadway

Missoula, MT 59802

Rick Henson (406) 728-7736

Jordon Contracting, Inc.

4 Miles West of Anaconda

Anaconda, MT 59711

Joe Jordon (406) 563-8276

McElroy & Wilken, Inc.

8-1 Whitefish Stage

Kalispell, MT 59901

Gary Wilken (406) 755-5775

McGree Corporation

12 East Gold

Butte, MT 59701

Dan McGree (406) 723-3728

Mergenthaler Transfer and Storage

1414 North Montana

Helena, MT 59601

Jon Largis (406)442-9470

Montana Rail Link, Inc.

101 International Way

P.O. Box 8779

Missoula, MT 59807

Howard Nash (406) 523-1500

Municipal Services, Inc.
742 1/2 Dunham
Billings, MT 59104
Don Speer (406) 245-9251

Olympus Environmental, Inc.
1660 B Street
Helena, MT 59601
Alan Stine or Ben Olmstead
(406) 443-3087

Pacific Industrial
1516 Old Hardin Road
Billings, MT 59101
Jeff Carter (406) 252-1999

Pioneer Refrigeration & Reclamation
3129 Eastside Hwy
Stevensville, MT 59870
Al Hendrickson (406) 777-5945

Prince, Inc.
1 Mile West
Forsyth, MT 59327-0440
Bonnie Prince (406) 356-2317

Safety-Kleen Corporation
South 32nd St. West & Gable Road
Billings, MT 59101
Scott Wagner (701) 237-9070

Special Resource Management
Interstate 90 Rocker Interchange
P.O. Box 4168
Butte, MT 59702
Tim Wood (406) 782-4201

Westran, Inc.
100 Western Way
Missoula, MT 59802
Gary Nelson or John Hettinger
(406) 721-1300

NORTH DAKOTA

Safety-Kleen Corporation
1537 1/2 First Avenue South
Fargo, ND 58103
Scott Wenger (701) 237-9070 or
1-800-669-6291

UTAH

T W Company
505 North Main
North Salt Lake, UT 84054
Tom Arnold (801) 299-1900

WASHINGTON

Safety-Kleen Corporation
E. 9516 Montgomery, Unit 19
Spokane, WA 99206
Wade Hardan (509) 928-8353 or
1-800-669-5902

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